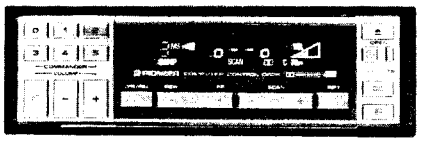
PIONEER®

Service Manual



The photo shows the model FX-K9/EW.

ORDER NO.
CRT-438-0

CENTRATE COMPONENT CAR STEREO CASSETTE DECK

FX-K9SDK WG
FX-K9B EW
FX-K9 EW

SPECIFICATIONS

General

Power source ..... DC 14.4V (10.8~15.6V allowable)
Grounding system ..... Negative type
Dimensions (chassis) ..... 178(W)×50(H)×175(D)mm
(front face) ..... 188(W)×58(H)×25(D)mm
(FX-K9B/EW)
Dimensions ..... 180(W)x50(H)x165(D)mm
(FX-K9SDK/WG, FX-K9/EW)
Weight ..... 2kg (Weight of main unit)
(FX-K9B/EW)
Weight 2.3kg
(FX-K9SDK/WG, FX-K9/EW)
Tone controls (bass) ..... ±10 dB (100Hz)
(treble) ..... ±10 dB (10kHz)
Maximum output level 200mV
Output impedance 1kΩ

Tape player

Tape ..... Compact cassette tape (C-30~C-90)
Tape speed ..... 4.76cm/sec. (+0.14cm/sec., −0.05cm/sec.)
Fast forward/rewind time ..... Approx. 100 sec. for C-60
Wow & flutter ..... 0.07% (WRMS)
Frequency response ..... Metal: 30~20,000Hz (±3 dB)
Normal: 30~16,000Hz (±3 dB)
Stereo separation ..... 45 dB
Signal-to-noise ratio .... Dolby C-type NR IN: 70 dB (IEC-A network)
Dolby B-type NR IN: 63 dB (IEC-A network)
Dolby NR OUT: 55 dB (IEC-A network)

Note:
Specifications and the design are subject to possible modification without notice due to improvements.

- Dolby and the double-D symbol are trademarks of Dolby Laboratories Licensing Corporation.
- Noise Reduction System manufactured under license from Dolby Laboratories Licensing Corporation.

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FX-K9

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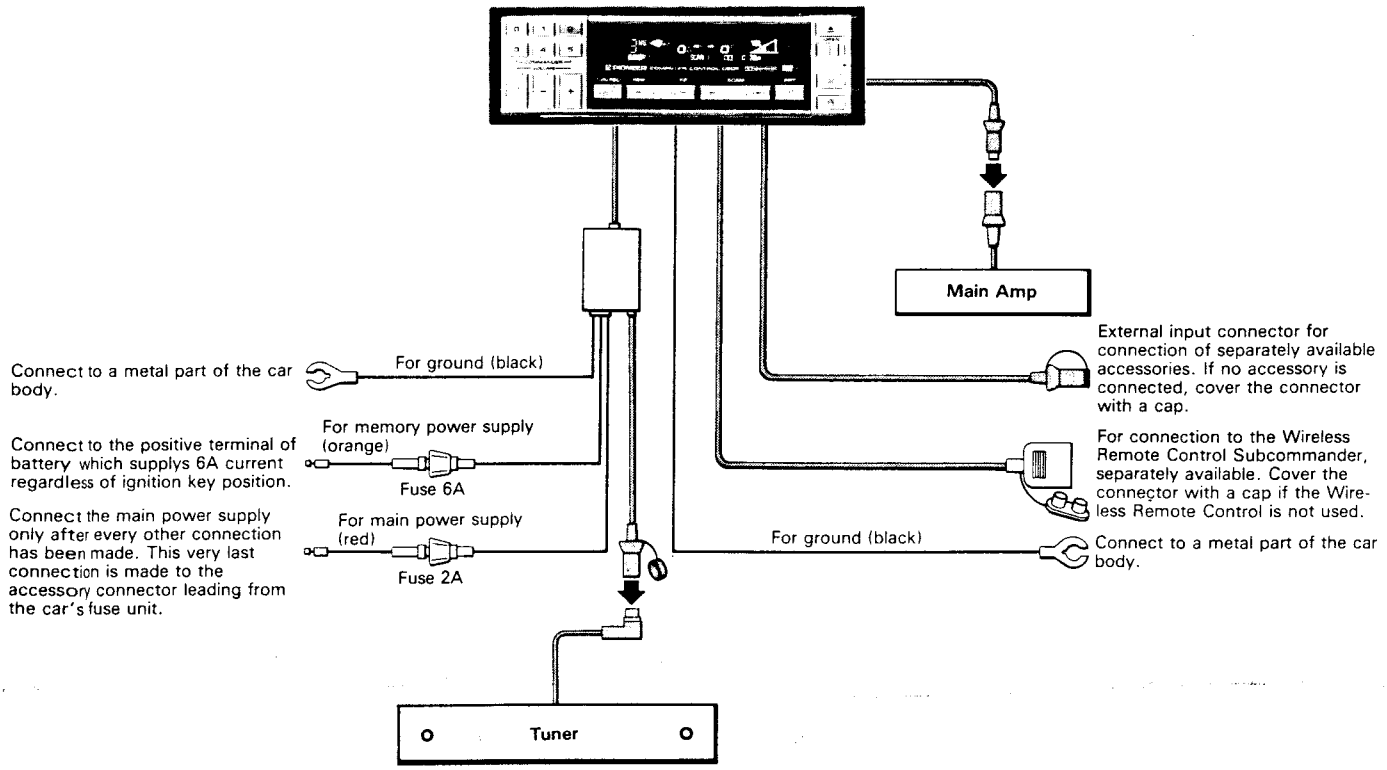
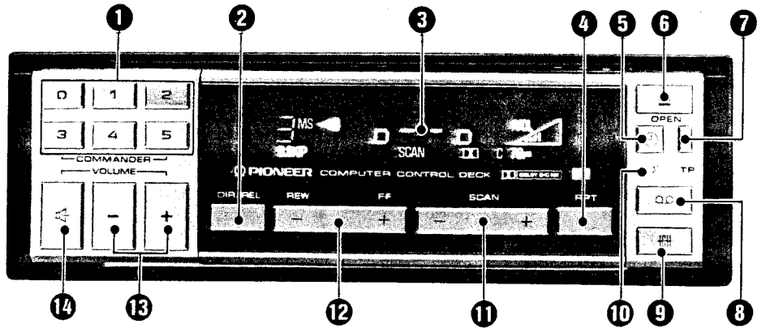
1. CONNECTING the UNITS


Main Amp
External input connector for connection of separately available accessories. If no accessory is connected, cover the connector with a cap.
For connection to the Wireless Remote Control Subcommander, separately available. Cover the connector with a cap if the Wireless Remote Control is not used.
Connect to a metal part of the car body.
For ground (black)
Connect to a metal part of the car body.
For memory power supply (orange)
Connect to the positive terminal of battery which supplys 6A current regardless of ignition key position.
Fuse 6A
Connect the main power supply only after every other connection has been made. This very last connection is made to the accessory connector leading from the car's fuse unit.
For main power supply (red)
Fuse 2A
For ground (black)
Tuner

2. NOMENCLATURE and USE



(Front section)

(Flip-Down Control Panel Section)

Tape Operation

❶ Command Button

Press the command button to set the number of recorded selections to be skipped or to set the number of times a piece is to be repeated.

❷ Program Switching/Release Button

Press this button to switch from side A to side B and vice versa. Also, you can press this button to cancel music scan, search, repeat, skip search, and fast forward or rewind.

❸ Display

❹ Music Repeat Button

Press this button to hear the piece you are listening to as many times as you wish. Also, with the repeat command set, the piece will play as many times as the number you have set. To cancel music repeat, press the release button or music repeat button one time.

❺ Clock Button

Press this button to display the time. Press it again and tape running display returns.

❻ Open/Eject Button

Press this button and the flip-down control panel opens. Press the button once more to eject the cassette.

❼ Program Timer Button

❽ Tape Power Switch

Press to stop the play of a selection. Pressing again will supply power and cause the tape to continue from the position at which it stopped. When switching to the tuner (sold separately), pressing the tuner power switch without turning the deck off will switch from the deck to the tuner.

❾ Tuner Power Switch

❿ Clear Button

Press this button with a pointed rod if the tape running should by chance malfunction (incorrect display, etc.). After several seconds, tape running will return to normal.

⓫ Music Scan Button

Pressing this button will advance the tape and play the first 10 seconds of the next selection. The tape will then advance to the next selection to play the first 10 seconds. This will continue until the release button is pressed. Pressing the release button during the 10 second periods will return the unit to normal playback mode.

⓬ Fast Forward Button (+)/Rewind Button (−) Set Minutes Button (+)/Set Hours Button (−)

Press the (+) side for fast forward or the (−) side for rewind. For music search, press this button twice. When setting time, press (+) side for minutes and (−) side for hours. When setting time, press (+) side for minutes and (−) side for hours while the clock button is depressed.

⓭ Volume Increase Button (+) Volume Decrease Button (−)

Press the (+) side to increase volume (soft → loud) or the (−) side to decrease volume (loud → soft). The button has 31 levels for adjustment. Each time you press the button, the volume level increases or decreases accordingly. Hold the button and the volume will increase or decrease continuously.

⓮ Attenuator Button

Press this button and volume level decreases instantaneously to 1/10 of the original volume. Press the button again and volume returns to the original level.

⓯ Cassette Insert Slot

Insert the tape side of a cassette into the slot and the deck will set the cassette automatically. At this time, the tape running display above the tape is always (◀) which indicates normal direction.

⓰ Balance Control

⓱ Bass Control

⓲ Treble Control

⓳ Dolby B-type NR Button

Press this button to play a tape recorded on a Dolby B-type NR system. (DD B will light up on the display.)

⓴ Dolby C-type NR Button

Press this button to play a tape recorded on a Dolby C-type NR system. (DD C will light up on the display.)

㉑ Blank Skip Button

Press this button (B.SKIP will light up on the display) and the blank between recorded sections (more than 12 seconds) will be skipped automatically to let the next selection play.

Tuner Operation

❶ Station Preset Button

A total of twelve FM stations (6 under FM1 and 6 under FM2), 6 MW stations and 6 LW stations can be preprogrammed into memory using this button. Once in memory, these 24 frequencies are available for tuning at the touch of a button.

❷ Band Switching/Release Button

Pressing this button will switch to the next band in the following order: FM1→FM2→MW→LW→FM1. This button also works to cancel a seek tune frequency.

❸ Display

❹ Memory Button

❼ Program Timer Button

Press this button to set the timer for a program, or to cancel a presetting of the timer. Two programs can be set with the timer.

❾ Tuner Power Switch

Press this button to turn on power to the tuner control section. Press the button again to turn power off.
Also, when you want to listen to a tape, press the tape power switch directly and tape play will be selected instead of the tuner.

❿ Clear Button

If something goes wrong (display is incorrect, etc.) while you are listening, press this button with a pointed rod. After several seconds, operation will return to normal. Remember that when you press this button, all preset frequencies entered into memory are erased and programmed function settings are cleared so you should make settings again as desired.

⓫ Seek Button

Pressing the (+) side of this button automatically advances the tuning to the next higher frequency, while pressing the (−) side tunes to the next lower frequency.

⓬ Tuning Button

Press the (+) side (low → high) or the (−) side (high → low) to adjust the station frequency setting.

㉑ Auto/Mono Switching Button

This button functions to help tune in FM broadcasts. Generally this button is pressed and left in the AUTO setting. (Note: The word AUTO is illuminated on the display in this setting.) In this position the unit will automatically switch to Hi-Fi when a strong signal is present, and to a tuning position where there is least noise or to monoaural when a weak signal is present.
Pressing the button once more (Note: the illuminated AUTO will disappear from the display) will allow tuning in of frequencies regardless of their strength, usually in monoaural.

㉒ Local Station Button

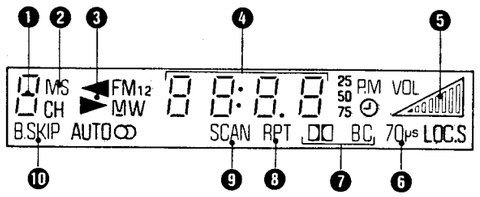
Use this button to change the search threshold level of the SEEK function. Normally, this button is kept in the OFF position. At night, when radio signal conditions are favorable, very weak signals are often detected and searched out by the SEEK function. Pressing this button (Note: LOC.S will illuminate on the display) will raise the search threshold level to eliminate this problem.

- All the press type control buttons have an electronic sound (beep) and display for dual checking to confirm operation.
- SEEK operations of the tuner and SCAN operations of the deck share the same button. Therefore, though the display shows the word SCAN, the SEEK function is actually being performed.

㉒ Local Station Button

- Buttons ❼, ❾, and ㉒ are used to control the Centrate Car Component Tuner (sold separately).
- All the press type control buttons have an electronic sound (beep) and display for dual checking to confirm operation.
- Noise reduction manufactured under license from Dolby Laboratories Licensing Corporation. "Dolby" and the double-D symbol are trade marks of Dolby Laboratories Licensing Corporation.

3. READING the DISPLAYS



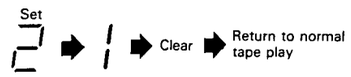
When Playing Tapes

❶ : Number of Times to Skip or Repeat

The number corresponding to the commander button pressed to set the number of recorded sections to skip in skip search or the number of times to replay in music repeat is displayed.

- For music repeat, the number of repeats is set and the display changes as shown in the following figure.

Example: Set repeat for 2 times



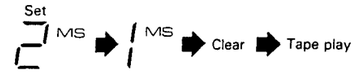
❷ MS : Skip Search/Music Search Display

MS display lights when skip search or music search is operating.

- For skip search, the display changes as shown in the following figure.

Example: To find the beginning of the second selection before the one being played.

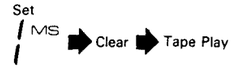
Example: To find the beginning of the second selection following the one being played.



- For music search, the display changes as shown in the follwoing figure.

Find the beginning of the presently playing piece.

Find the beginning of the next piece following the presently playing piece.

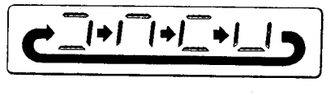


❸ ◀ : Tape Play Indication

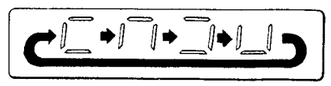
When playing back upper tracks ◀ mark appears and when lower tracks are played back, ▶ mark appears.

❹-1 : Tape Play, Fast Forward/Rewind Indication

When the ◀ mark appears, tape travel is in the normal direction (right to left) and the mark rolls in the direction shown in the following figure: (counterclockwise)



When the ▶ mark appears, tape travel is in the reverse direction (left to right) and the mark rolls in the direction shown in the following figure: (clockwise)



During fast forward and rewind, speed of rotation of the mark is faster. During fast forward, the mark rolls in the forward direction. During rewind, the mark rolls in the reverse direction.

❹-2 : ATSC (Automatic Tape Slack Canceler) Display

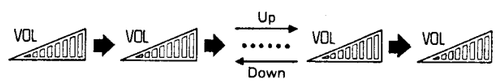
When a cassette is set in the deck, the tape slack is taken up automatically. At this time display flashes.

❹-3 : Time Display

Press the clock button and time is displayed. Refer to page 17 for further details.

❺ VOL : Volume Level /Attenuator Display

Press the volume button and volume level is indicated in yellow steps from 1 to 15 and red steps from 16 to 31. Volume level change is indicated as shown in the following figure. The ◢ symbol is always lit.



Press the attenuator button and the entire LED will flash to indicate volume has been reduced to 1/10 of the original level.

❻ 70μs : 70μs Tape Display

Insert a cassette tape and the auto tape selector will automatically switch the equalizer (70μs/120μs). If it is a 70μs tape, the 70μs display will illuminate. If it is a 120μs tape, there is no display.

❼ DOLBY B BC : Dolby B and C NR Display

Press B button to listen to a tape recorded on Dolby B-type NR. DOLBY B display will illuminate. You may also press C button to listen to a tape recorded on Dolby C-type NR. DOLBY C display will illuminate.

❽ RPT : Music Repeat Display

Press music repeat button and RPT display will illuminate to indicate the function is operating.

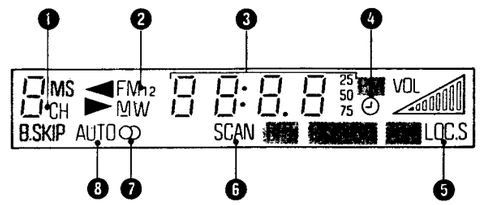
❾ SCAN : Music Scan Display

Press music scan button and SCAN display will illuminate to indicate the function is operating.

❿ B.SKIP : Blank Skip Display

Press blank skip button and B.SKIP display will illuminate to indicate the function is operating.

When Listening to the Tuner



❶ CH : Channel Number Display

Press the station preset button and the number of preset channel is displayed.

❷ FM12/MW : Band Display

Pressing the band switching button will let you select to and display the band you desire (FM1 → FM2 → MW → LW → FM1). Select FM1 or FM2 to listen to an FM broadcast, MW to listen to an MW broadcast and LW for LW broadcasts.

❸ : Frequency Display

When the tuner is turned on, each band can be displayed over the following frequency ranges: FM = 87.5~108MHz, MW = 531~1,602kHz, LW = 153~281kHz.

❹ : Program Timer Display

When setting the timer, display will illuminate to indicate the timer is operating.

❺ LOC.S : Local Station Display

Press local station button and LOC.S display will illuminate to indicate the function is operating.

❻ SCAN : Seek Display

Pressing the seek button will illuminate SCAN on the display. Though SCAN appears on the display, the SEEK function is actually being performed.

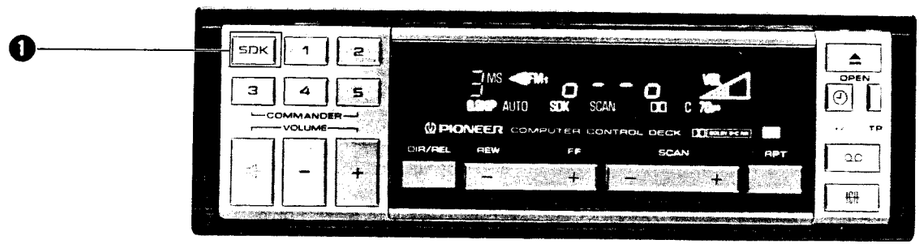
❼ : FM Stereo Reception Display

When FM stereo is being received, is illuminated.

❽ AUTO : Auto Display

Pressing the auto/mono switching button illuminates AUTO on the display. When pressed one more, it will go out.

4. NOMENCLATURE and USE (FX-K9SDK/WG)

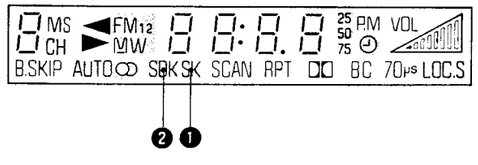


Tuner Operation

❶ SDK Button

When this button is set to the ON position, traffic information broadcasts can be monitored. When in the FM1 or FM2 bands, pressing this button and adjusting the tuning button allows the reception of current local traffic information.

5. READING the DISPLAYS (FX-K9SDK/WG)



❶ SK : SK Display

When a traffic information station is tuned in, SK will be illuminated on the display.

❷ SDK : SDK Display

When the display band indicator is in the FM position, pressing the SDK button will cause the letters "SDK" to be displayed. Even during tape playback, if the band is in the FM position "SDK" will be displayed.

6. PARTS LOCATION

NOTE

- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ : GENERALLY MOVES FASTER THAN ★.
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

- **FX-K9SDK/WG**
  FX-K9/EW

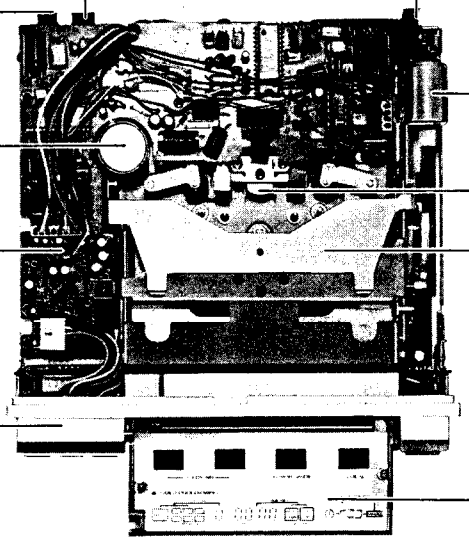


Fig. 1

- **FX-K9B/EW**

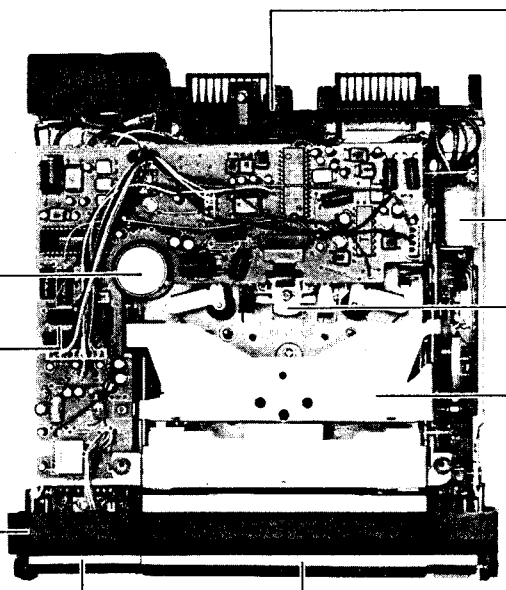
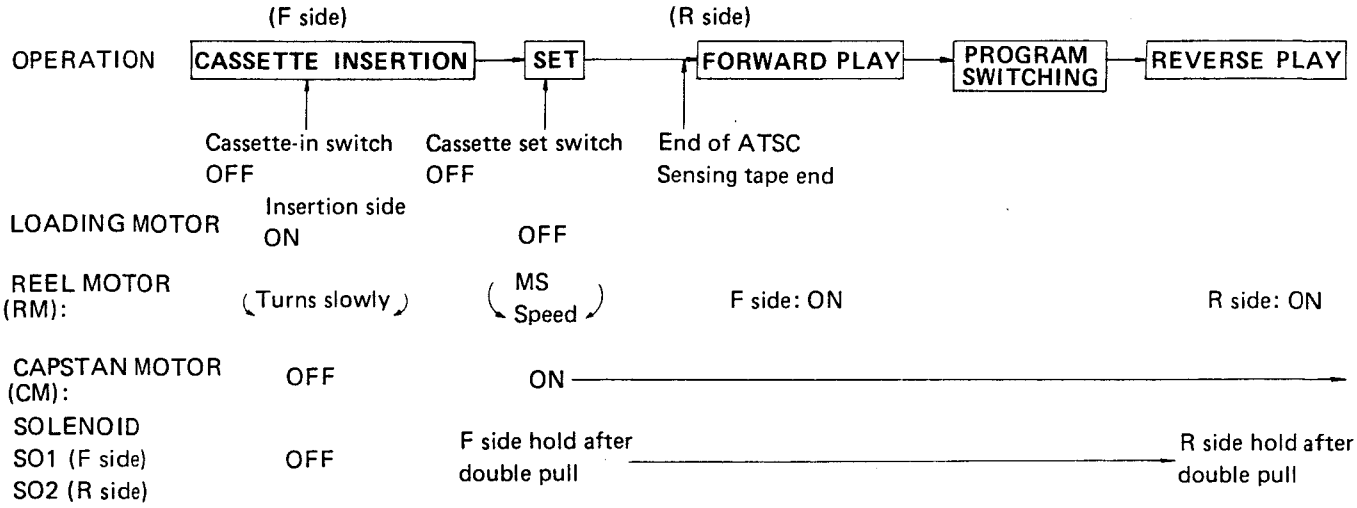


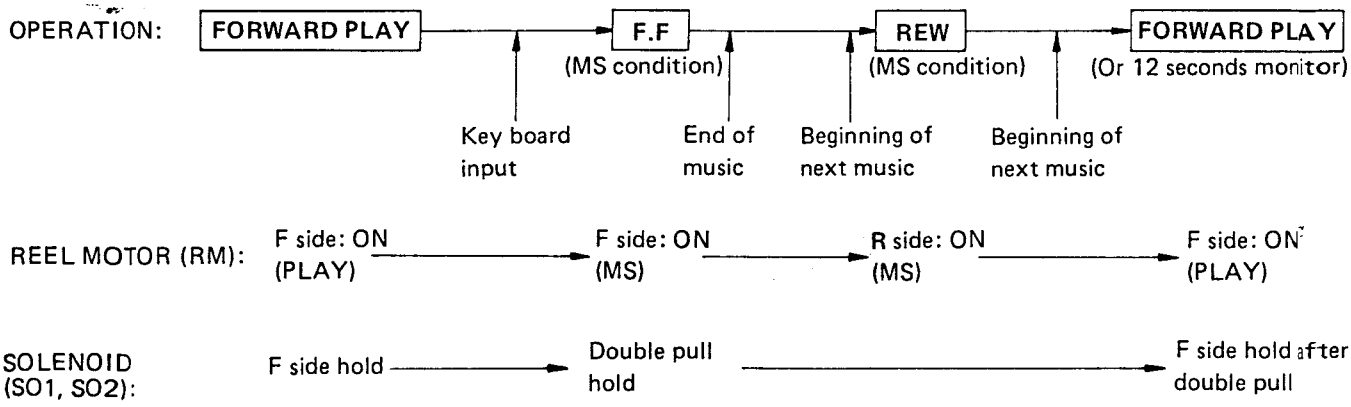
Fig. 2

7. OPERATION EXPLANATION

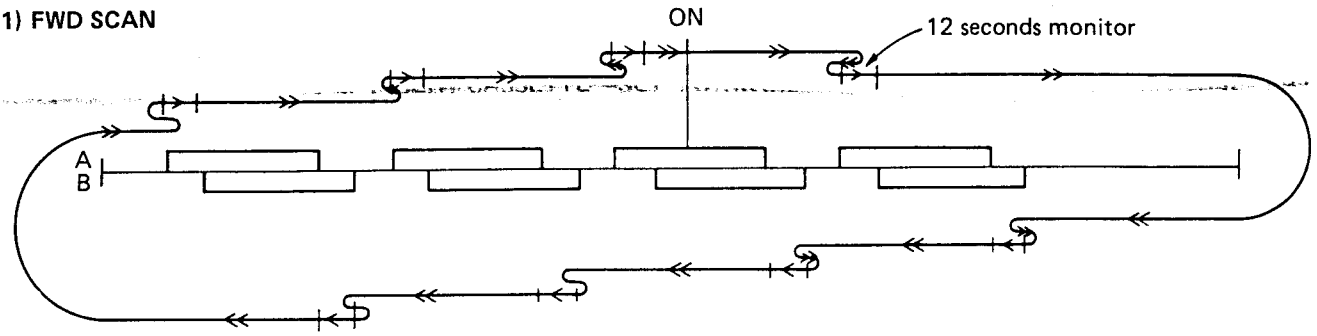
① OPERATION: INSERT CASSETTE→SET FORWARD PLAY→PROGRAM SWITCH→REVERSE PLAY



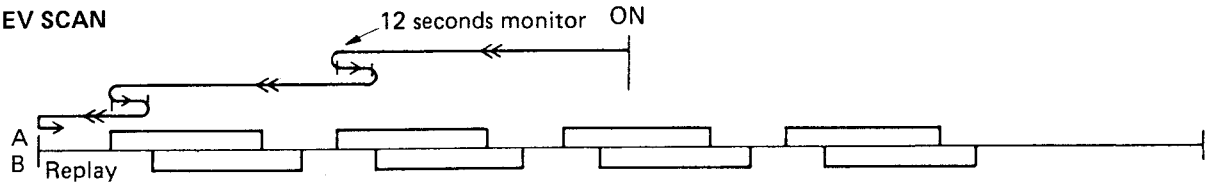
② During F.F MS or SCAN



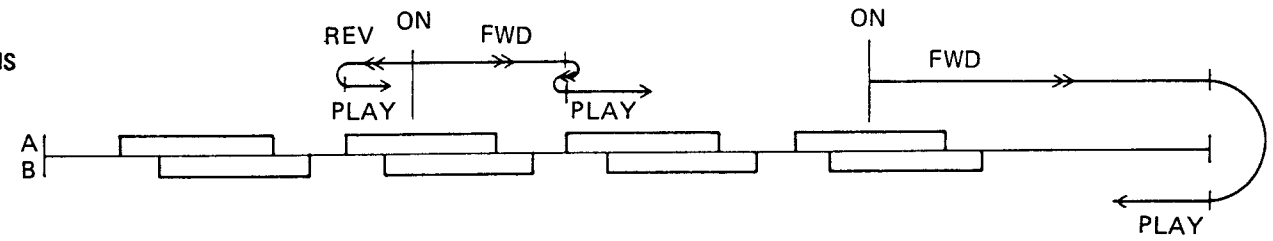
(1) FWD SCAN



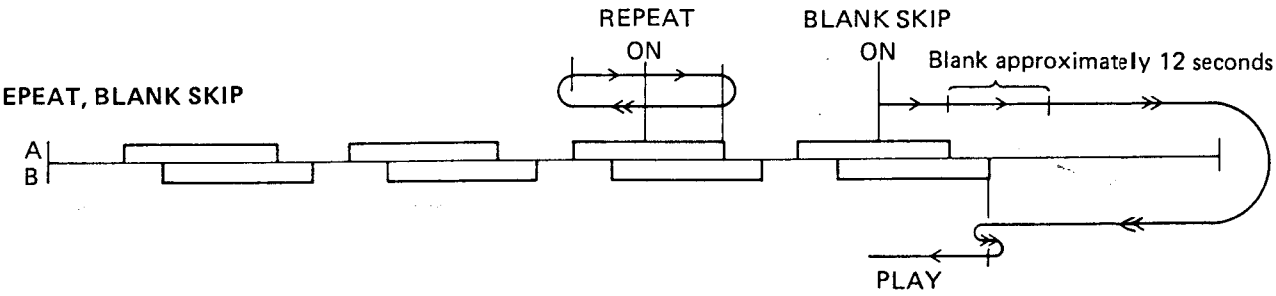
(2) REV SCAN



(3) MS



(4) REPEAT, BLANK SKIP



A and B represent the A and B sides of the cassette.

A side moves in the direction of ——→

→ or ← indicates PLAY condition.

⇒ or ⇐ indicates F.F or REW (for MS condition).

▭ indicates music portion

8. DISASSEMBLY

• Removing the Case (FX-K9SDK/WG, FX-K9/EW)

1. Undo 7 screws to remove the case unit.

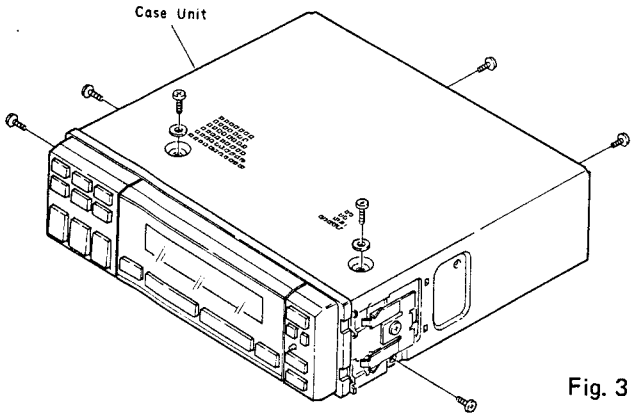


Fig. 3

• Removing the Case (FX-K9B/EW)

1. Undo 8 screws to remove the case unit.

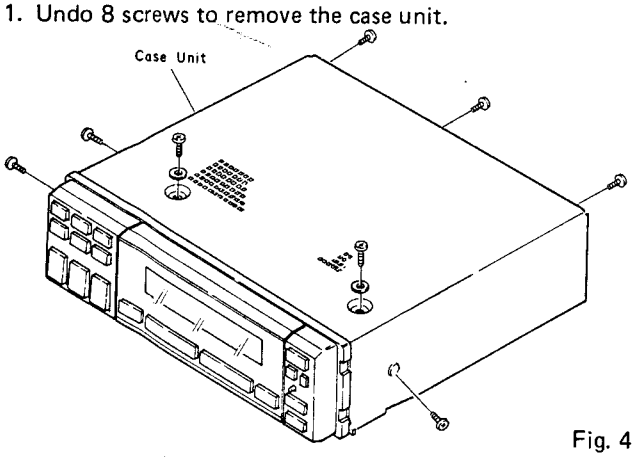


Fig. 4

• Removing the Power Unit

1. Undo 2 screws to remove the power unit in the direction indicated by the arrows.

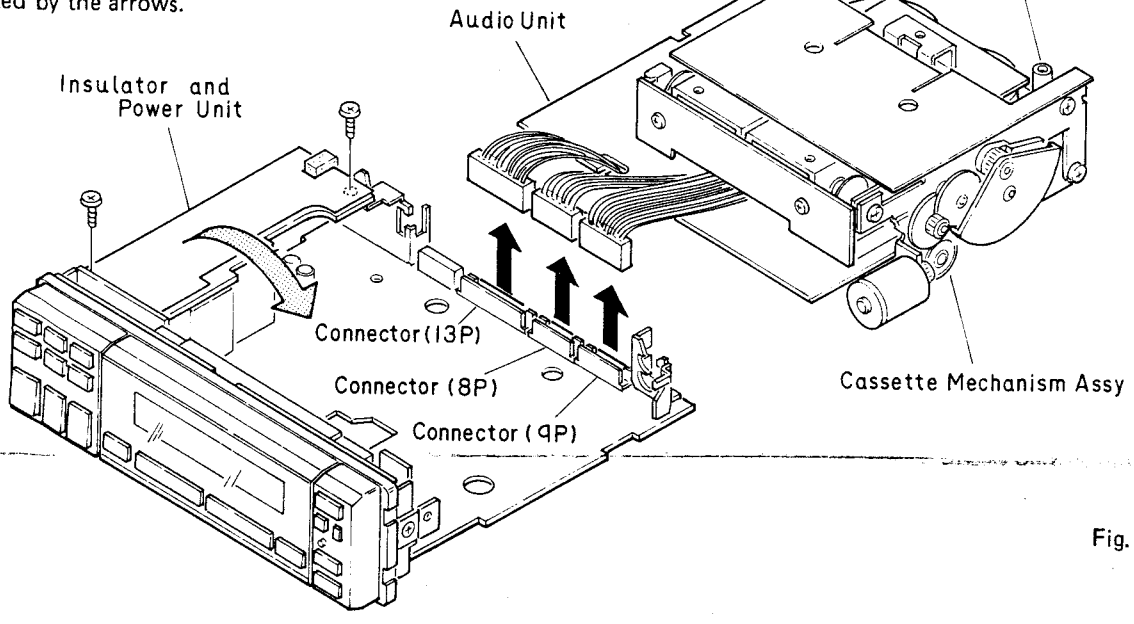


Fig. 6

• Removing the Cassette Mechanism Assy and Audio Unit

1. Undo the 5 screws indicated in the diagram.
2. Disconnect the 5P connector.
3. Remove the cassette mechanism assy and audio unit together towards the rear.

Note: When remounting the cassette mechanism assy, check that none of the IC pins (of PD4022B and PD4050B) is damaged by the studs (see Fig. 5).

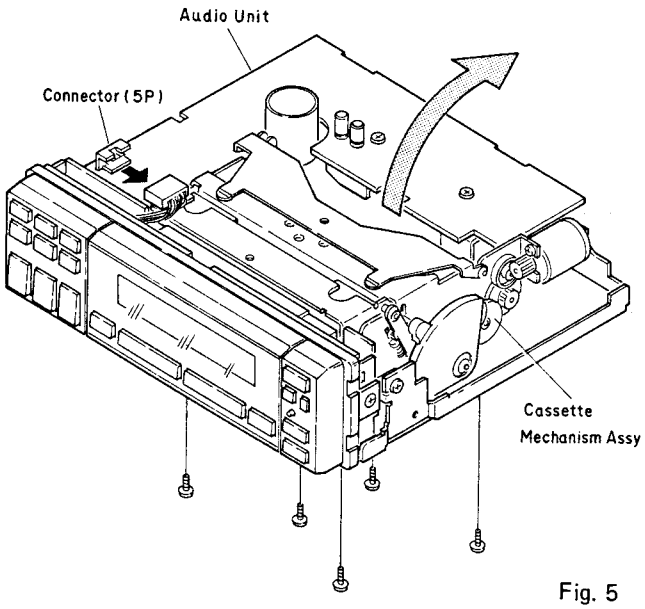


Fig. 5

● Removing the Chassis

1. Turn the set over, and undo 4 screws to release the chassis.

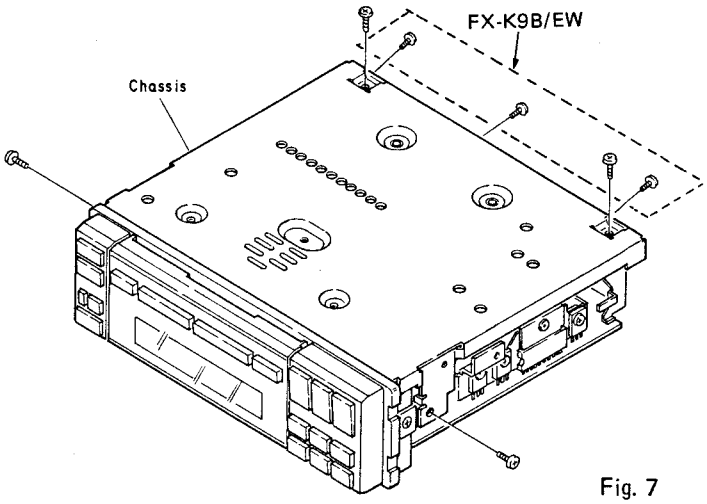


Fig. 7

● Removing the Grille Unit

1. Undo 2 screws and remove the flexible board solder at A, B, and C to remove the grille unit.

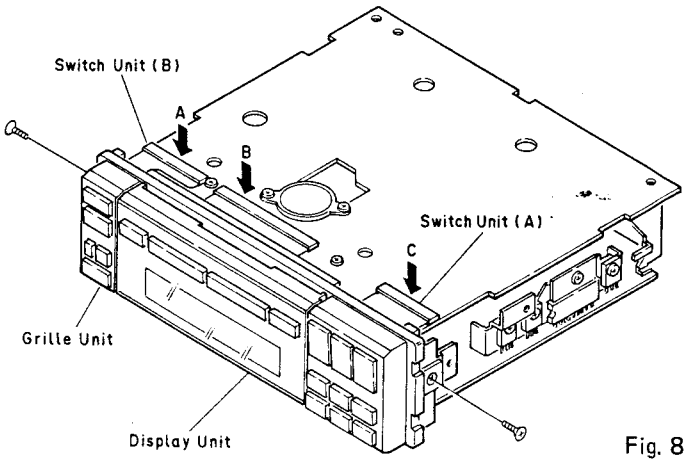


Fig. 8

● Removing Switch Unit (B)

1. Undo screw D to remove switch unit (B) together with the bracket.

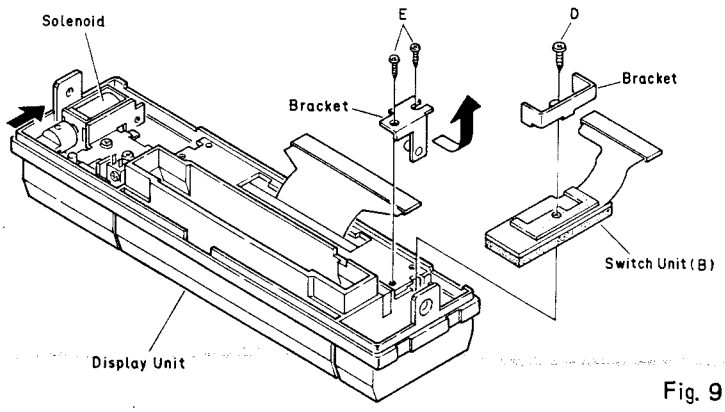


Fig. 9

• Removing the Display Unit

1. Undo screws E to remove the bracket. Since the bracket serves as a fulcrum about which the display unit can turn, displace the unit sideways as indicated by the arrow to release the unit. (Fig. 9)
2. Depress the solenoid lever in the direction of the arrow to open the display unit. (Fig. 9)
3. The display can then be removed as indicated in Fig. 10.
4. The circuit board inside the display unit can be removed by undoing screws F.

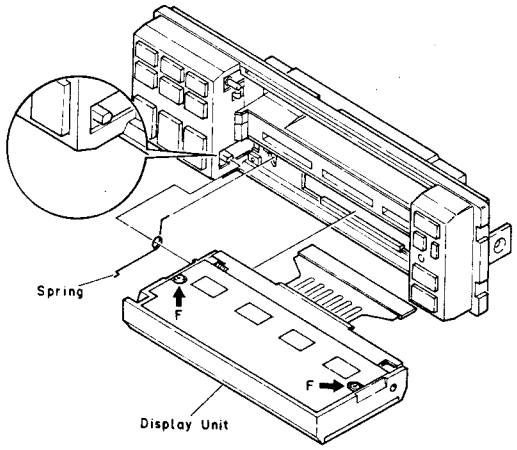


Fig. 10

• Removing Switch Unit (A)

1. Undo 2 screws to remove the solenoid unit (Fig. 11).
2. Undo 2 screws to remove the gear unit (Fig. 11).
3. Undo 2 screws to remove switch unit (A) (Fig. 12).

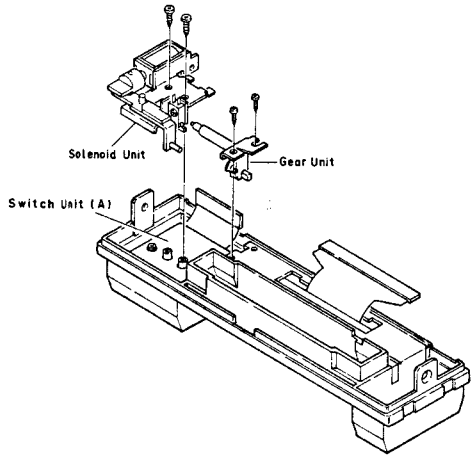


Fig. 11

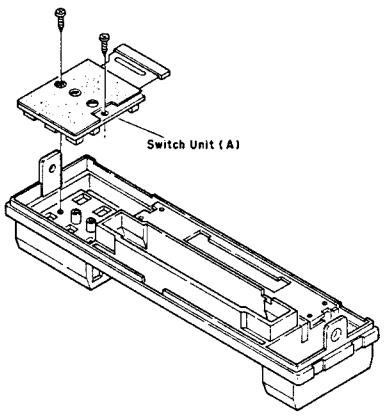


Fig. 12

9. CIRCUIT DESCRIPTION

9.1 CONTROL SECTION

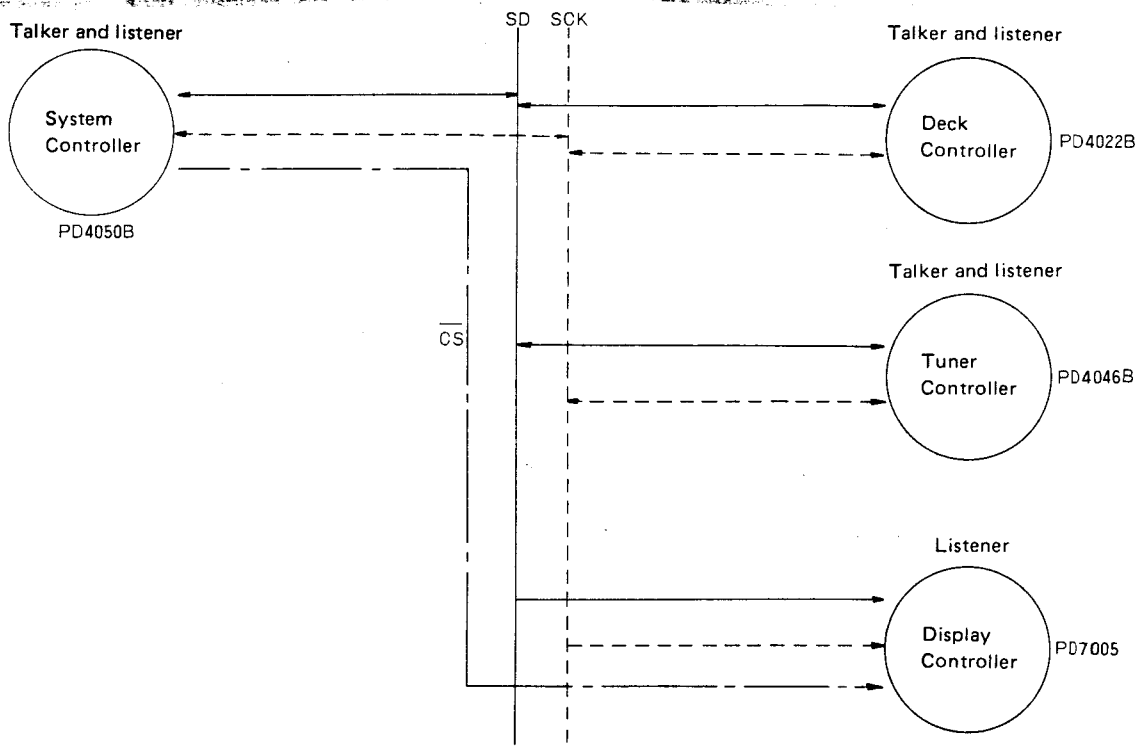


Fig. 13 System diagram

• System Outline

The system controller(PD4050B),deck controller (PD4022B), and tuner controller(PD4046B) are inter-connected by 8-bit serial data transfer. The three signal lines are the data line (SD), serial clock line ($\overline{SCK}$), and the $\overline{CS}$ line between the system controller and display controller. The system, deck, and tuner controllers are switched automatically to talker and listener according to the timing indicated in Fig.14. The display controller is a listener only which receives 80-bit serial data inputs from the system controller via the $\overline{CS}$ signal line. Data transfer between controllers is executed by switching the system, deck, and tuner controllers to talker and listener on a cyclic basis (as indicated in Fig. 14). If no command output is received from the deck and tuner controller within two seconds after output of a command from the system controller, a reset output command is subsequently generated by the system controller. This is then followed by output of a standby command, resulting in both the tuner and deck being switched off. The deck and tuner controllers which have received the reset command from the system controller have been set to become listeners at any time. The standby command from the system controller is thus received under these conditions.

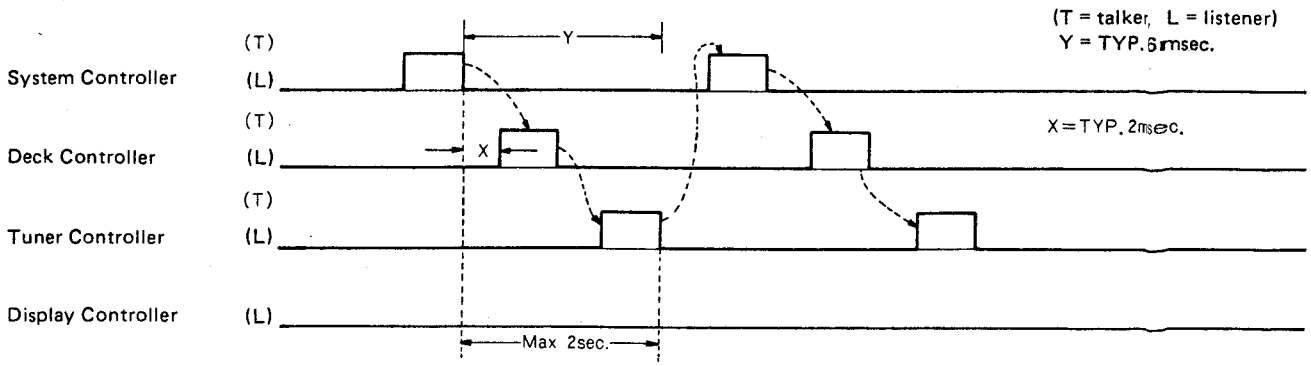


Fig. 14 Talker/listener switching timing

When the tuner is not connected to the system, the system controller is switched to talker after data is received from the deck controller.
When the system controller passes display data independently to the display controller, output of a display command when the system controller is a talker is followed by output of the $\overline{CS}$ signal and 80-bit display data to the display controller. After the display command is received the deck controller waits until transmission of the 80-bit display data has been completed before switching to talker status.

The tuner controller also waits for transmission of the 80-bit display data to be completed before switching to deck controller command reception mode. For the deck and tuner controllers to change the display contents in the display unit, each controller generates 80 bits of display data following output of the relevant command during talker status. Listener deck or tuner controller skips reading the 80 bits of data. Following input of the 80 bits of data, the system controller adds the necessary volume data etc, and switches temporarily to talker status for output of 80 bits of display data to the display controller.

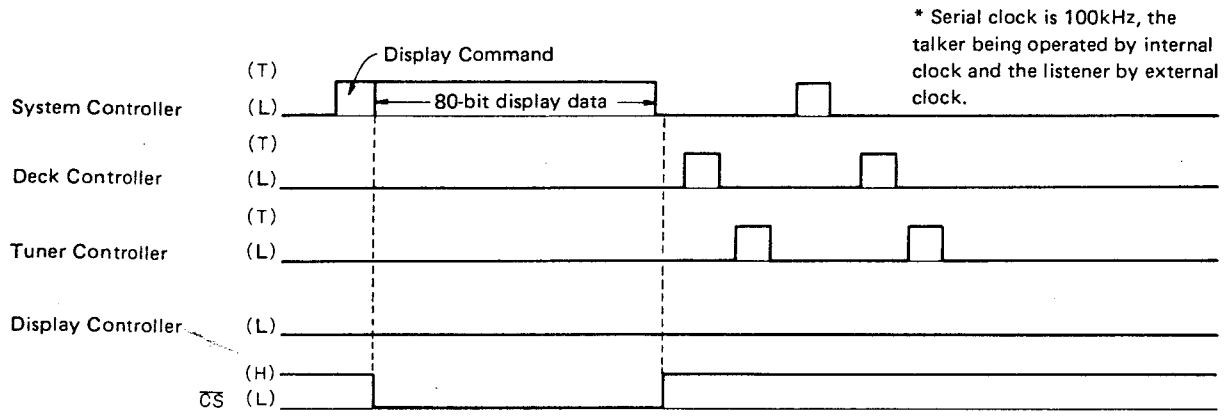


Fig. 15 System controller display data transmission timing

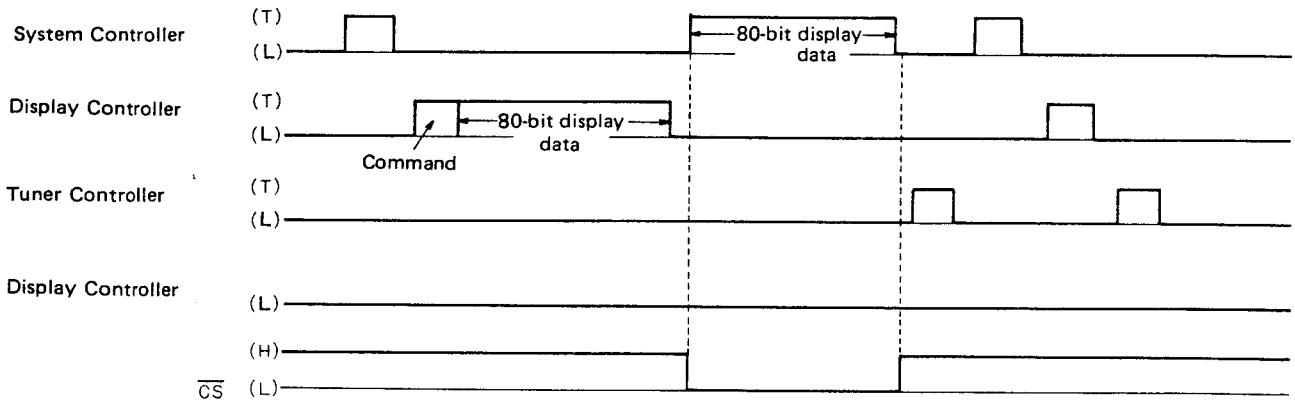


Fig. 16 Timing for display data output from deck controller

• Standby Function

The system controller checks whether the car's Acc key is ON or OFF at least once every 6msec. (pin 50). If the key has been switched OFF and the system controller is switched to talker status, a display command is generated and 80 bits of "all 0" data is passed to the display controller, resulting in the display being cleared. When the system controller is next switched to talker status, the standby command is passed to the deck and tuner controllers, resulting in the deck and tuner being switched off.
During standby mode (Acc OFF), the deck and tuner controllers back up only the RAM data, the CPU functions being halted. If the system controller check finds that Acc is ON, the clock counter functions are continued. If the Acc ON condition is detected for two seconds, the system controller transmits a display command to the serial interface together with the display data preceding the change to Acc OFF condition, resulting in the deck and tuner controller standby mode being cancelled by that data. If the mode when Acc is switched OFF is deck or tuner mode, a tape or tuner command is generated and the mode is reverted to the mode when Acc was OFF.

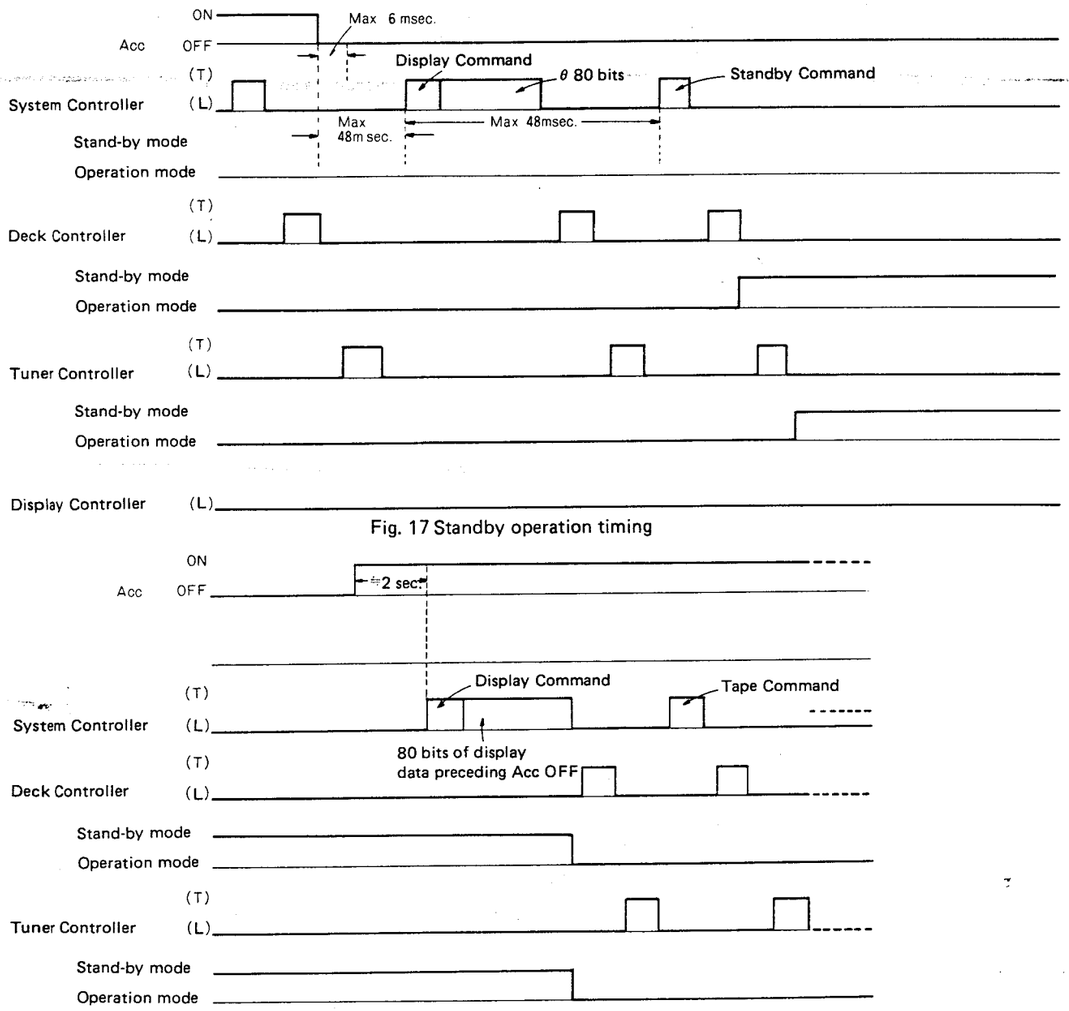


Fig. 17 Standby operation timing

Fig. 18 Standby cancellation timing (when in deck mode before Acc is switched OFF).

- Tape Tuner Switching

1. Switching from tape to tuner.

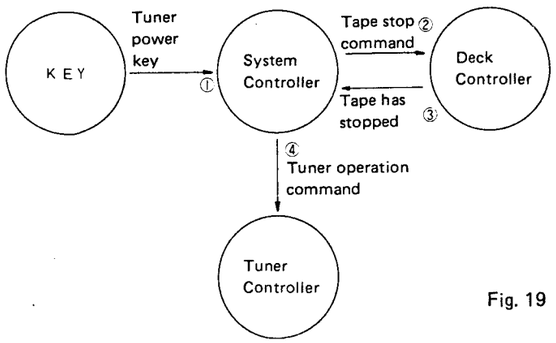


Fig. 19

If the tuner power switch is pressed during tape operation, a "tape stop command" from the system controller is passed to the deck controller. When the system controller then receives data indicating that the "tape has stopped" in response from the deck controller, a "tuner operation" command is passed to the tuner controller, thereby switching from tape to tuner operation.

2. Switching from tuner to tape

a. When the tape power switch is pressed (Fig. 20)

Then the tape power switch is pressed during tuner mode operation, a "tuner stop" command is passed from the system controller to the tuner controller. When the system controller then receives data indicating that the "tuner has stopped" in response from the tuner controller, a "tape operation" command is passed to the deck, thereby switching the set from tuner to tape operation.

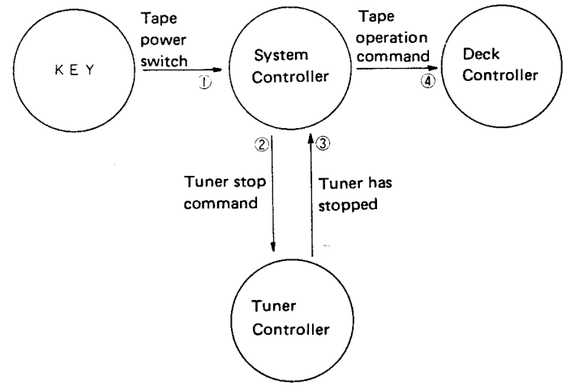


Fig. 20

b. When a cassette tape is loaded (Fig. 21)

When a cassette tape is loaded during tuner operation, "tape operation request" data is passed from the deck controller to the system controller. When the system controller receives this data, a "tuner stop" command is passed to the tuner controller, and after data indicating that the "tuner has stopped" is received from the tuner controller, a "tape operation" command is passed to the deck controller. Hence, the set is switched automatically from tuner to tape when a cassette tape is loaded.

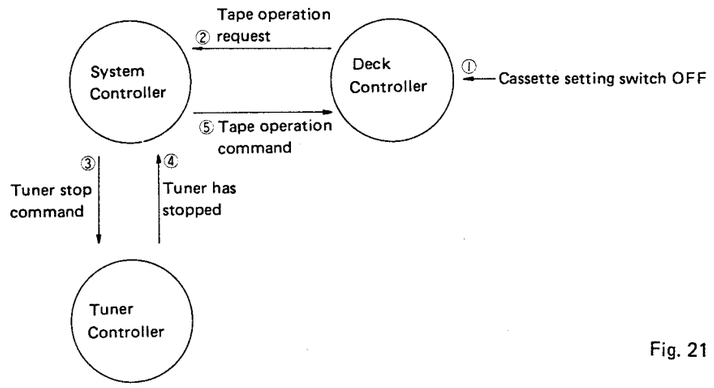


Fig. 21

9.2 POWER SUPPLY CIRCUIT

a. Backup +B

To keep memories, backup +B is supplied to PD4050B and PD4022B even when the ignition switch is off. The +B (14.4V) battery source directly flows through D8 in the Power Unit and is reduced to 5.3V for VDD +B by the voltage regulator composed of Q4, D5, D6, etc. This VDD +B (5V) is applied to pins #7 and #33 (VDD) of PD4050B and PD4022B and to pin #5 (VDD) of PD7005.

b. Acc +B

When the ignition switch is turned on, Acc +B (14.4V) is applied to pins #7 (Vcc1) and #8 (Vcc2) of BA6209 and #5 of PA3009.

c. +B Supply for TAPE

When the TAPE is loaded, the deck controller PD4022B puts TAPE ON signal (H: 5V) out of #23. This signal turns Q23 and Q6 in Control Unit on.(*1) When Q6 turns on, Acc +B flows through D24-1, R164 and D26 (zener diode Vz: 6.2V) and turns Q40 and Q7 on.(*2) When Q7 turns on, Acc +B becomes BT +B and is applied to DC-DC converter L1 #4 for displaying.
This BT +B (14.2V) is reduced to 10V by the voltage regulator composed of Q6, D9, etc. in Power Unit becomes AU +B (10V) and is applied to each of the PA0005A #16, HA17358 #8 and PA2014 #1 Vcc terminals. And the AU +B (10V) flows in D2 and is made 9.4V by D2's forward voltage drop (VF) and is applied to TA75558P #8 (Vcc). After passing Q6, Control Unit, the Acc +B is reduced to TAPE +B1 (10V) by the regulator composed of Q1, Q2, Q3, D3, etc. in the Power Unit and is fed to PA0008 #10 (Vcc). This regulator employs a differential amplifier as a voltage sensor to stabilize output voltage and to minimize wow and flutter. If the reference voltage for the circuits which control the Reel Motor and Capstan Motor fluctuates, the servo circuits will not work properly and will increase wow and flutter. The TAPE +B1 (9.5V) is further reduced to 5V by the regulator composed of Q5, D4, D5, etc. in the Power Unit and is fed to PA0002A #4 (Vcc). The TAPE +B1 (10V) goes through R67 and turns Q2 and Q1 on. Then TAPE +B2 is fed to PA3017 #1 (Vcc). TAPE +B2 is also fed to TA7705P #1 (Vcc) via D1.

d. +B Supply for TUNER

When TUNER is turned on PD4050B#19 puts out TUNER ON signal (H:5V). This signal turns Q25 and Q24 on. When Q24 turns on, Acc +B flows through D24-2, R164 and D26 and turns Q40 and Q7 on. The BT +B and AU +B are applied to each AF IC in the same way as in the mode of TAPE ON. But, TAPE +B2 to the Vcc of TA7705 and PA3017, which have no relation to the Tuner, is blocked by inactive Q1.

**1 The reason for connecting resistors in parallel:*
Some circuits require a large current. This connection allows a large current to go through resistors of small power capacity. The power capacity of each chip-resistor is only 1/8W at present and is insufficient to allow a large current. But by connecting two resistors in parallel the total current can be doubled. Many resistors in other models and equipment have been connected in parallel for this reason.

**2 The role of zener diode D26*
The BT +B is used for the SWD (switched) +B of power amplifier (for example, GM-A120). So, the power amplifier is turned on and off by BT +B. This SWD +B is used also to mute the audio signal. So, if the falling time of BT +B is long, it takes a long time to activate muting and allows a popping noise when the TUNER or TAPE is turned off. To prevent this, zener diode D26 makes Q40 turn off and block the BT +B quickly after the TUNER or TAPE is turned off.

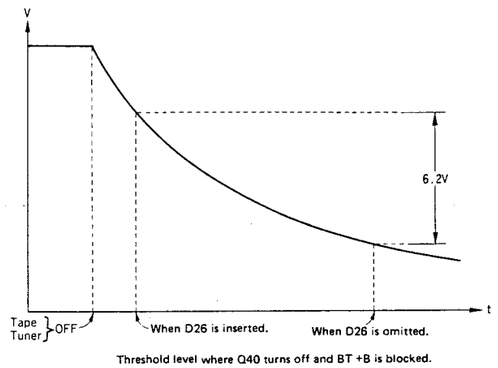


Fig. 22 Q40 OFF timing

9.3 BASIC CIRCUIT FOR OPERATING THE SYSTEM (Fig. 24)

a. System Clock (CL1 & CL2)

The clock generator gives a reference timing to each computer. The resistor and capacitor connected to CL1 and CL2 determine oscillation frequency. The pins #7 (X7C), #6 (X7R) and #8 (X7) of PD7005 work in the same way as above. The oscillation frequency of all generators is 200kHz. Refer to the circuit diagram for the waveforms at each terminal.

b. Timing Clock (T OUT)

This circuit generates squarewave synchronizing clock signal of 100Hz (50% duty factor for operating PD4050B). PD4022B #37) (T OUT) feeds PD4050B #10 (CLK) with this CLK signal because PD4050B has no timing clock generator inside.

c. Reset

This circuit resets the initial state of the computer programs and their Display Controller PD7005. When the backup +B is connected, this resets the computers and PD7005 by feeding their RESET terminal (#3) with an H pulse of about 25ms. Without resetting, the computers will work randomly and become uncontrollable.

When the Backup +B is connected, VDD is fed to the computers and PD7005. At this time, Q20 in the Control Unit is off, Q19 is biased by R51 and is turned on. VDD is fed to PD4050B #3 via R158, to PD4022B #3 via R49, to PD4046B #3 via R131 and to PD7005 #3 via R4 and shifts the level of the terminals to H (5V). The +B charges C25 and C26 via D8, D15 and R61. Q20's VB rises as the charge in C25 and C26 increases. Q20 turns on when its VB becomes 0.7V. Q19 turns off. Then the potential at all RESET terminals is shifted from H (5V) to L (0V) and resetting is completed. When the CLEAR (CANCEL) button (S23) is depressed, all of their P3 terminals are shifted to H in the same way as when the power is turned on. When the button is released the level falls to L (0V) and at the falling edge resetting is executed.

d. Acc

When PD4050B #50 (Acc) is L (0V), PD4050B keeps memory, counts clock, senses low or high Acc input and TUNER connection, and stops all other functions. To operate the system the potential at PD4050B #50 should be H (5V). When +B is fed from Acc (red line), a current is fed to Q34-B via D31 and R123. Q34 turns on. Then Q33 turns off. VDD (5V) is fed to PD4050B #50 via R122 and R129.

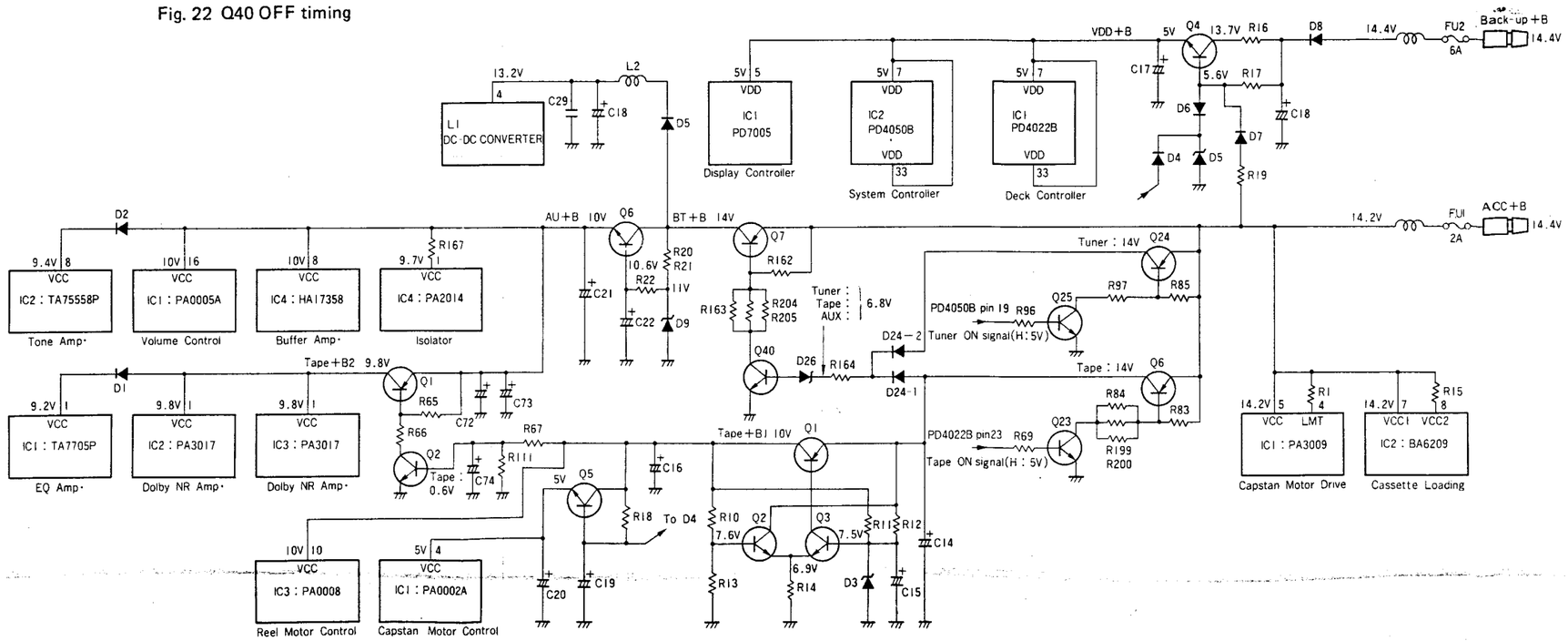


Fig. 23 Power supply circuit

e. Serial Data Circuit (SO, SI and DATA)

Centering PD4050B, the three microcomputers communicate with each other using a data line or bus. PD4050B periodically gives PD4022B or PD4046B a command, and PD4022B or PD4046B responds it. The command and response are transmitted in the form of 8-bit serial data. The data bus also allows the 80-bit serial display data to pass. The waveforms of the signals on the bus (or at the SI terminal of each computer) observed on an oscilloscope are shown in the circuit diagram. Still waveforms are unavailable because they always vary quickly. Three examples of the waveforms have been illustrated in the circuit diagram. The data communication among the computers can be deemed to be normal as long as a waveform similar to the example can be observed at SI and DATA terminals because the form on the oscilloscope screen flows and never stays still.
The transistors connected to each output terminal (SO) of the computers work as invertering buffers. There will be no problem with the input and output connected to the same line because a command has a code which fits a particular computer, and each computer accepts only the input signal which has a code fit to it.

f. $\overline{SCK}$

This terminal puts in or out synchronizing clock signals for controlling serial data transmission. When talking, the computer is in the output mode and, when listening, in the input mode and it accepts $\overline{SCK}$ signal from the talking computer. At this time, talker's $\overline{SCK}$ data appear on the bus in series. The waveform of the signal on the $\overline{SCK}$ terminal observed on the oscilloscope is as shown in the circuit diagram. The still form of this wave is also unavailable with an ordinary oscilloscope.

g. $\overline{CS}$

PD4050B does not put out a command with the code explained above for DISPLAY but puts out a $\overline{CS}$ signal (L pulse) from # 48 synchronizing with its 80-bit serial DISPLAY data. PD7005 accepts the DISPLAY data coming from PD4050B # 15 (SO) only when $\overline{CS}$ is L (0V), then decodes and displays them. It is also impossible to observe the still waveform of these data on the oscilloscope.

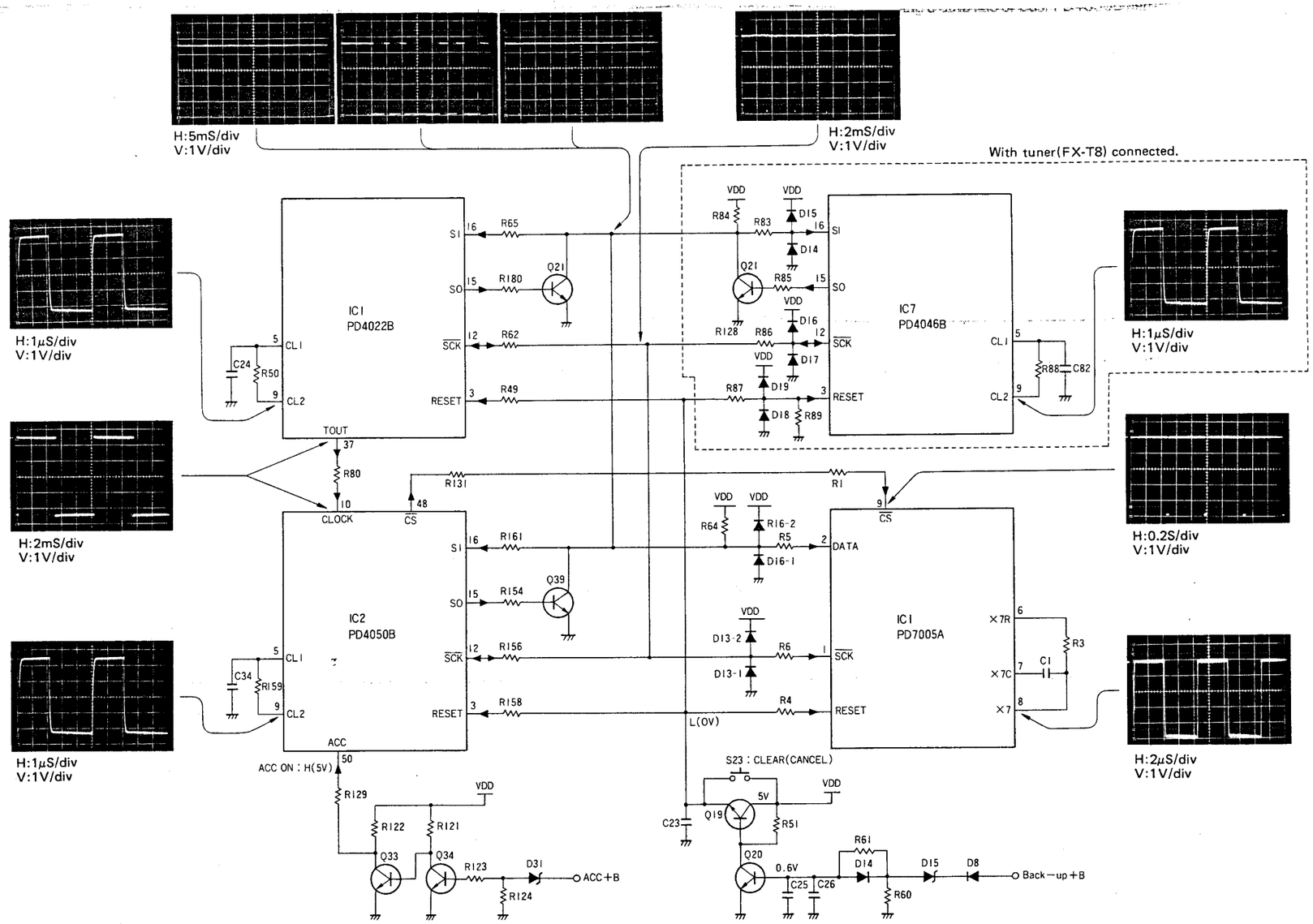


Fig. 24 Basic circuit for operating the system

9.4 SYSTEM CONTROL INPUT CIRCUIT

a. Key Input Circuit

The key input consists of 8 strobe outputs and 4 return inputs connected in matrix, however, it is actually 7 × 4 because the pin #23 (D6) is left unused. This strobe signal (D0-D7) is put out in the timing shown in Fig. 25. When the TUNER button is depressed, S25 turns on. The #25 (D0) output is fed to the pin #44 (R3) via D12, S25 and R134. Then, PD4050B sends a command to PD4046B in the tuner circuit and activates the tuner circuit. At this time, PD4050B puts out a 3.8kHz square wave signal from the pin #49 (BUZZER) for 30ms to inform that it has accepted the TUNER-ON key input.
As this signal is 5V and is not strong enough to drive piezoelectric buzzer (X1) directly, it goes to Q35 via R130, turns Q35 on and off for 30ms and is amplified to 8.5V and drives the buzzer. Then a "beep" sound is generated every time the key input is accepted. If there is trouble in the above circuit, no sound will be generated even though the key is depressed. Zener diode D30 (Vz: 20V) is to absorb the counter-electromotive force generated in the buzzer.

b. Door Sense Input (Q2)

PD4050B senses the state of the door with this circuit as this model has no exclusive EJECT key (button). A key is commonly used for opening and ejecting. So, PD4050B has to determine whether to open the door or eject the tape when OPEN (S20) is depressed. This circuit feeds PD4050B with a signal to open the door when it is close and to eject the tape when it is open.
When the door is closed, S26 is closed. Q1 and Q2 are off. Then, the signal from #24 (D7) to #44 (R3) is blocked. When the door is open, S26 opens, Q1 and Q2 turn on, and the signal is fed to #44 (R3).

c. Remote Control Input Circuit

A remote control signal selects a function by activating the transistor connected in parallel to the tact switch of a particular function in the Switch Unit. But the remote controller does not have the functions of command buttons (0) — (5). So PD4050B selects the mode (0) when Q53 (MS/CH) is turned on. When Q53 (MS/CH) turns on once, PD4050B recognizes the signal as (0). When it turns on twice successively, the IC recognizes it as (1), three times, as (2), and so on.

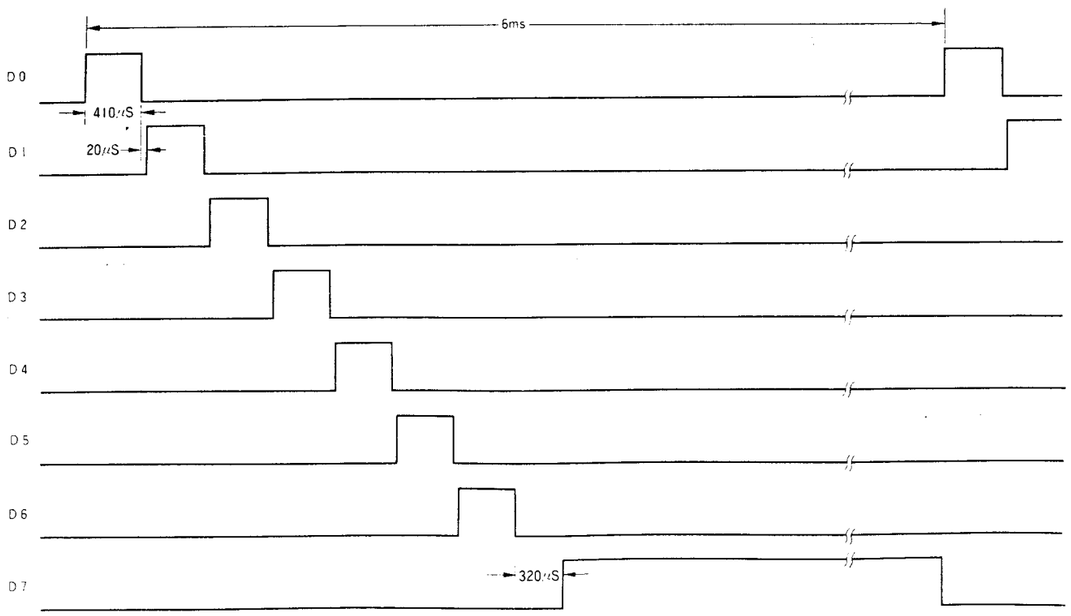


Fig. 25 Strobe signal timing

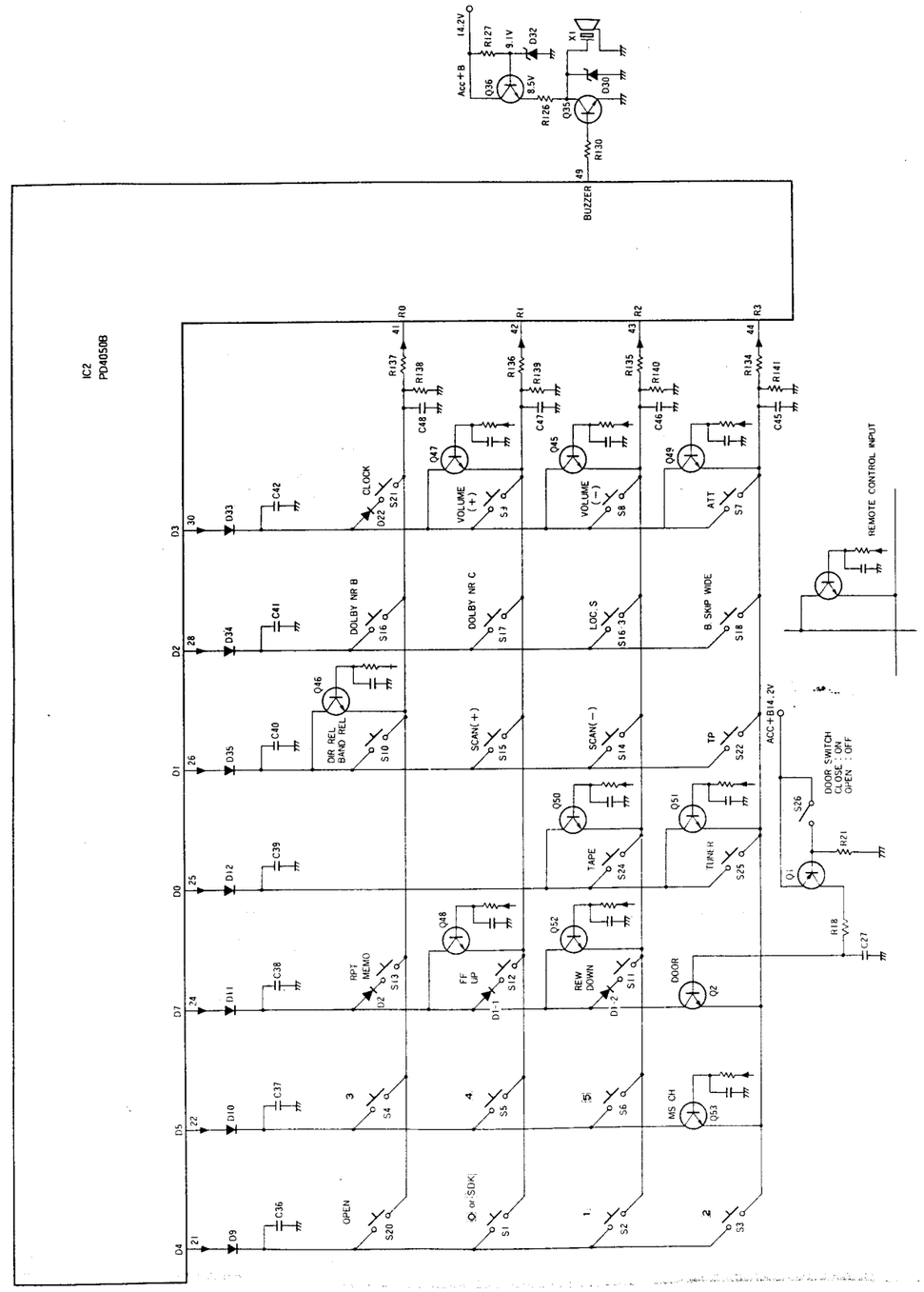


Fig. 26 System control input circuit

9.5 ILLUMINATION AND DISPLAY CIRCUIT

a. Illumination for Each Button

ILMI +B (14.2V) is fed from power amplifier (e.g. GM-A120) to this circuit. The +B goes to the LEDs in the buttons via resistors. The parallel connection of the resistors on the +B line is to increase the power capacity explained in "9.2 Power Supply Circuit."

b. Lamp in the Door

The door lamp is switched on by the Door Sensor (S26). When the door opens, S26 turns off and Q1 and Q3 turn on. Acc +B is fed to the lamp and turns it on.

c. TAPE/TUNER Display

When Q6 (TAPE) or Q24 (TUNER) turns on, Acc +B is fed to Q30 via D19-1 or D19-2 and R90. Q30 turns on. Q26 – Q29 turn on. Then, +B is fed to the TAPE or TUNER LED Array. PD4050B #15 (SO) puts out data for indicating TAPE or TUNER and feeds them to PD7005 #2 (DATA). When PD7005 receives the TAPE display data, it puts H (4V) out of #28 (ILMI TAPE). Keeping the level of #28 High, it shifts #27 (ILMI TUNER) to L (0V). When it receives the TUNER display data, it puts L (0V) out of #28 keeping #27 High (4V).
When #27 is H (4V), Q1 turns on and the TUNER LED array turns on. When #28 is H, Q2 turns on and the TAPE LED array turns on. Both LED arrays turn on for a short time when the TUNER or TAPE is depressed because #27 and #28 are initially H. When the Door opens, #27 and #28 shift to L (0V) and turn the LED arrays off.

d. FL Display Drive Circuit.

Fig. 7 shows the FL display drive circuit. FL's filament is heated by AC. The potential at the anode and grid should be more than 10V DC higher than that at filament to turn the FL on. A DC-DC converter has been employed to obtain two voltages. One is to shift BT +B (+13.2V) to −30V. This becomes the V-negative source for displaying. Another is to obtain AC for the eight filaments. The AC is taken out of the transformer which has been coupled with the oscillator built in the converter. The V⁻ (−30V) is reduced to about −14V by the zener diode (D21). The −14V is fed to the center terminal of the transformer. Then, the DC applied to the filament becomes a pulsive DC of −14V average. When PD7005 puts out H (4V) for the anode and grid, the potential difference between the anode and cathode becomes about +18V (4V − (−14V)) and the FL turns on. Fig. 27

e. FL Display Timing

The 80-bit display data from PD4050B are decoded and put out by PD7005 in the form of an 8-digit (grid) × 10-segment (anode). In other words, this FL display lights dynamically.

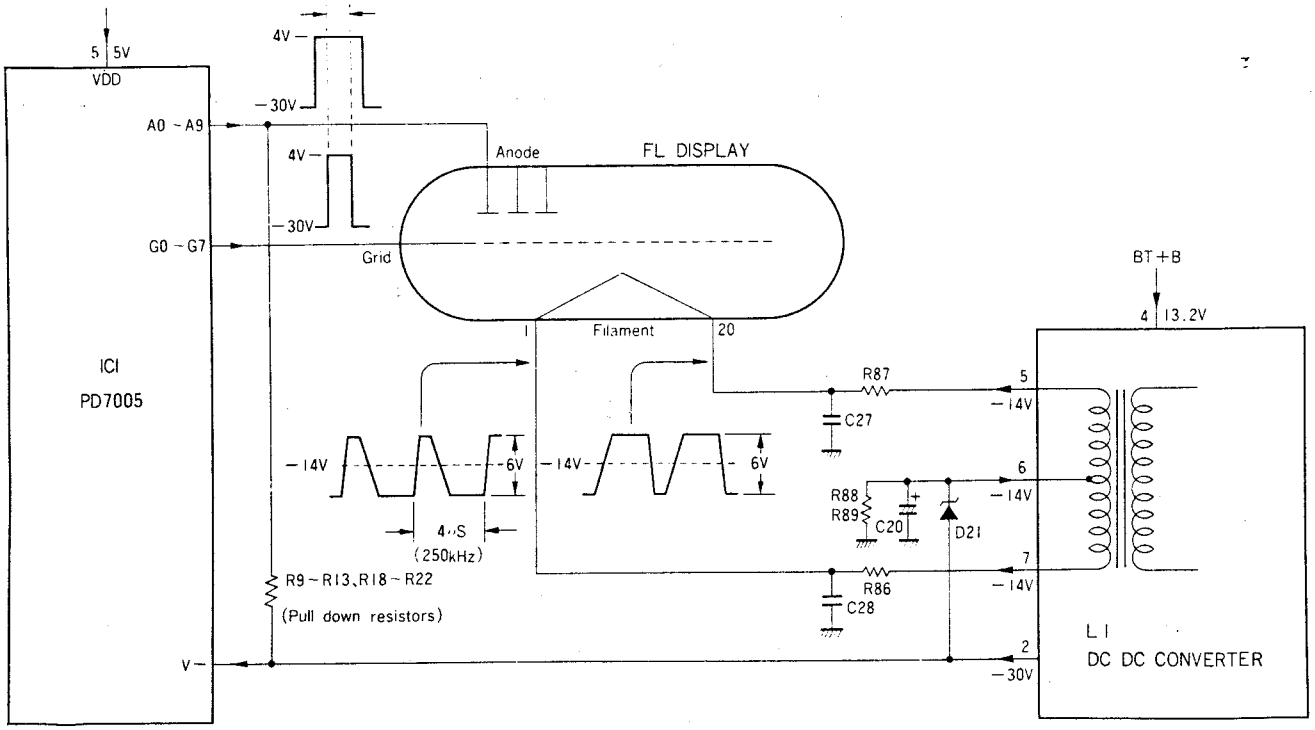


Fig. 27 FL display drive circuit

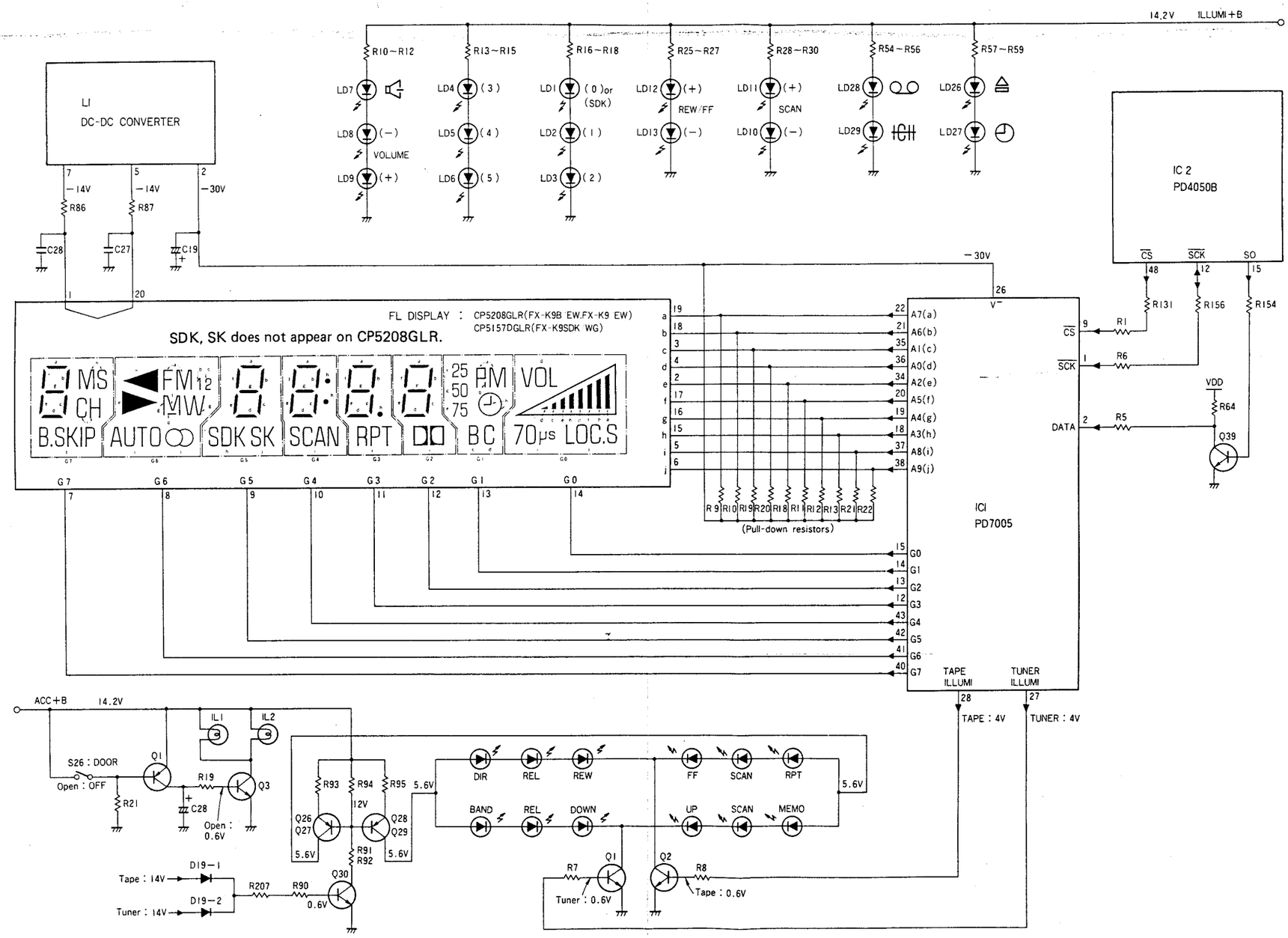


Fig. 28 Illumination and display circuit

9.6 DOOR-OPENING AND TAPE-LAODING CIRCUITS

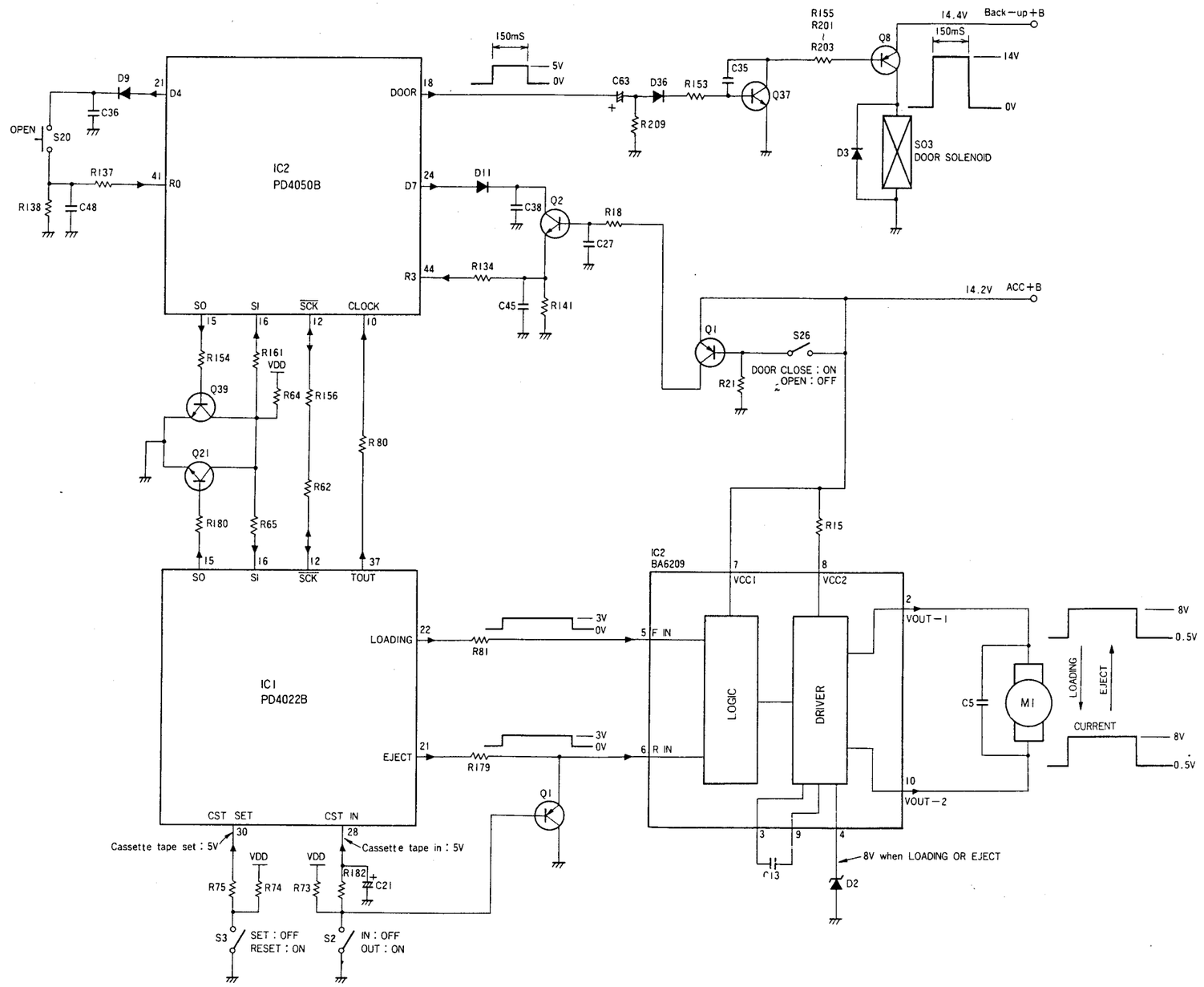


Fig. 29 Door-opening and Tape-loading circuit

a. Opening the Door

When the door is closed and the OPEN (S20) is depressed, PD4050B accepts the OPEN signal. Then, PD4050B puts the Door Open signal (an H pulse of 150ms) out of #18 (DOOR). This signal goes to Q37 and Q8 via C63, D36 and R153 and turns them on for 150ms. During the period Q8 is on, the Door Solenoid unlocks the door and a spring opens the door.

b. Loading a Tape

The S2 (CST IN) switch opens when a tape is loaded. V_{DD} (5V) is applied to PD4022B #28 (CST IN) via R73 and R182, and the level at pin #28 is shifted to H. Then, its #22 (LOADING) puts out a loading signal (H:5V). The signal passes through R81 and shifts BA6209 #5 (FIN) to H (3V). Then, BA6209 puts the motor drive current (8V) out of #2 (Vout 1) to turn the loading motor in the loading direction. The output voltage for driving the motor is determined by the Vz of the zener diode connected to BA6209 #4. #10 works in the same way.
When loading is completed, S3 (CST SET) opens and shifts PD4022B #30 (CST SET) to H (5V). The H level shifts #22 to L (0V). As the loading signal disappears, BA6209 stops putting the motor drive current out of #2 (Vout 1) (0.5V) and stops the motor. When PD4022B #30 shifts to H, it requests a tape operation command from PD4050B. When PD4022B receives the command from PD4050B, it starts playing the tape.

c. Tape EJECT

When OPEN (S20) is depressed during the time the door is open, PD4050B gives PD4022B an EJECT command. When PD4022B receives the EJECT command, it puts out the EJECT signal (H:5V) from pin #21 (EJECT). The signal goes to BA6209 #6 (R IN) via R179 and shifts the level at #6 to H (3V). The H level at #6 makes BA6209 put out motor drive current (8V) from #10 (Vout 2) to reverse the loading motor and eject the tape. As the motor turns, the tape is ejected. When the ejection is completed, S2 (CST IN) turns on. PD4022B #28 and #21 shifts to L (0V) in turn. The EJECT signal disappears and BA6209 #10 (Vout 2) shifts to L (0.5V) and stops putting out the motor drive signal. The motor stops. The Q1 connected to BA6209 #6 is to eliminate the shifting time lag between pins #28 and #21. Q1 turns on right after S2 turns on to shift the EJECT signal to L and stop the motor.

9.7 AUDIO SIGNAL CONTROL CIRCUIT

a. FWD/REV

FWD/REV switching is made in TA7705P. When the cassette mechanism is in the forward mode, PD4022B #24 (FWD/REV) puts out L (0V) and when it is in the reverse mode, it puts out H (5V). This signal is fed to TA7705P.#3 via R70. TA7705P turns the electronic switch to connect the forward amplifier when its pin #3 is L (0V) and to the reverse amplifier when it is H (5V).

b. EQ (Metal)

The selection of playback equalizer, normal or metal/CrO_2 is made automatically. The METAL switch (S1) senses the opening of 70μs on the cassette shells. PD4022B selects the PB equalizer in accordance with the signal level at pin #18 (METAL).
When a METAL or CrO_2 tape is loaded, S1 opens. H (5V) is fed from V_{DD} to PD4022B #18 (METAL) via R178. PD4022B puts H (5V) out of #19 when #18 becomes H. This output is fed to TA7705P #15 (NORMAL/METAL) via R68 and R14. TA7705P puts out the same signal as that of #2 (OUT) from #4 (METAL OUT). Then, R5 and R9 in the NF circuit, which determine the equalizer curve, compose a parallel circuit and make the time constant of 70μs. In the Normal mode, the time constant is 120μs without using R9. This operation is made during the period of the Automatic Tape Slack Cancel (ATSC) operation after loading a tape, and the mode is maintained until the time of ejection.

c. Dolby Noise Reduction

The level applied to PA3017 #30 (OFF/B/C) determines the type of Dolby circuit. The level is 0V, 1/2Vcc or Vcc for OFF, B or C respectively. So, the maximum input level at PA3017 #30 should be as high as Vcc or 10V. But PD4022B's H output is only 5V because its V_{DD} is 5V. So, a DC-DC converter composed of Q3, Q4, Q5, etc. is required to raise the voltage. When DOLBY is off, PD4022B #17 (DOLBY) is L (0V). With this L level, Q4-E is grounded by R66. Q4 and Q3 turn on. When Q3 turns on, L is fed to PA3017 #30 via R72, and the IC goes into DOLBY OFF mode. At this time, the potential at pin #30 falls down to 3V or less but not to 0V. This is because 1/2Vcc reference voltage appears at #30 when it is open. When Dolby NR B (S16) on the reverse side of the operation flap is depressed, PD4050B sends a command to PD4022B. PD4022B puts H (5V) out of #17 when it receives the Dolby B command. This H signal is fed to Q5 via R66 and D3-2 and turns Q5 on. Then, Q4 and Q3 turn off. When Q5 turns on, TAPE +B2 (9.8V) is divided by R68 and R71 and is made about 5V (1/2Vcc). This voltage is fed to PA3017 #30 via R72, and PA3017 goes into the Dolby B mode.
When the Dolby C (S17) is depressed, PD4022B receives the Dolby C command and puts its pin #17 in a high impedance state. This means that #17 is opened. So, Q3, Q4 and Q5 turn off.

The TAPE +B2 (9.8V) is fed to PA3017 # 30 via R68 and R72. Then, PA3017 goes into the Dolby C mode. At this time, the potential at # 30 increases to 7V or a little higher but not to 9.8V. The reason for this is the same as that explained in "When Dolby is off."

d. Muting

This is an audio signal muting circuit. PD4022B # 20 (MUTE) keeps H (5V) level when the mechanism is shifting or in the mode of FF, REW or MS. Then this signal goes through D17-2 and R82 and turns Q22 on. Then VDD (5V) goes to PA2014 #15 (MUTE) via D1 and R172. PA2014 mutes the audio signal when the level at #15 is shifted to H (about 3V). At the same time the VDD goes through R173, turns Q41 (Q42) on and mutes PA2014's output. When loading and ejecting, muting is also done in the same way as above with the H (5V) signal coming out of # 21 or # 22. When switching the TUNER on and off, PD4050B # 20(T MUTE) puts out an H (5V) pulse. The pulse goes into Q38 via R152, turns Q38 on and mutes the audio signal.

e. Volume Control Circuit

The sound volume is controlled by the DC voltage fed from buffer amplifier HA17358 in the Audio Unit to PA0005A #12 (CONTROL IN) in Volume Unit via R3. The DC signal is made by converting the 6-bit digital signal, which comes out of PD4050B, into an analog signal by a D-A converter made of radder resistors. The control signal can theoretically be varied in 64 steps (2^6). But, PD4050B makes 32 steps of different height (4, 2 or 1) to approximate the characteristics curve "C" of analog volume control. Fig. 30 shows the characteristic of volume control type C.
When ATT (S7) is depressed, the output level of VOLUME data is reduced to attenuate the sound volume by 20dB.

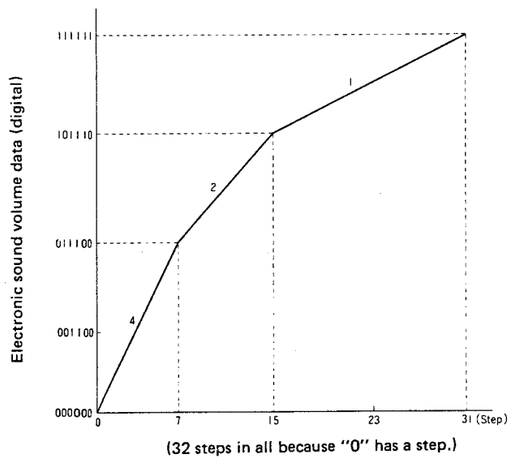


Fig. 30 Volume control "Curve C"

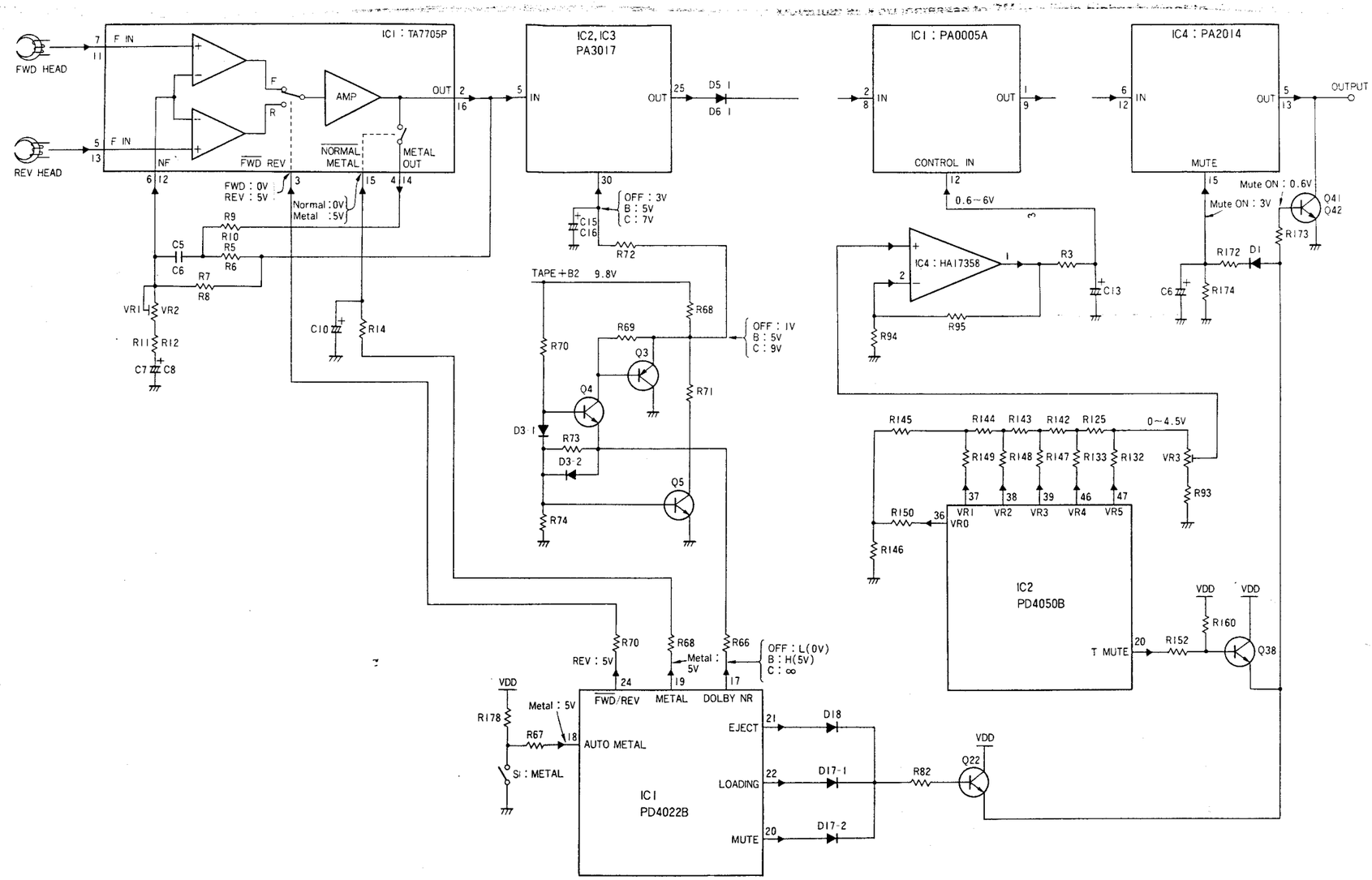


Fig. 31 Audio signal control circuit

9.8 BLOCK DIAGRAM

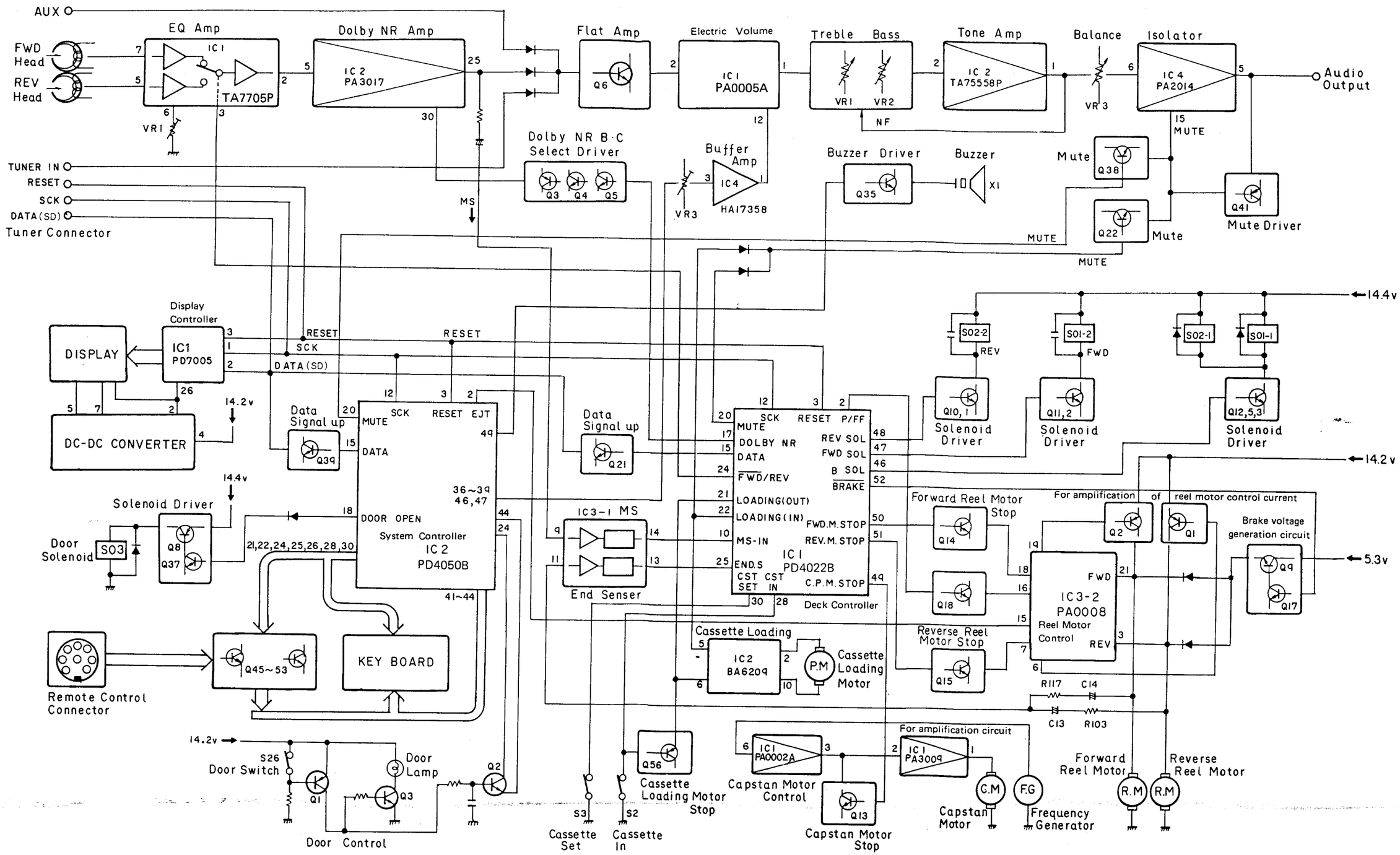
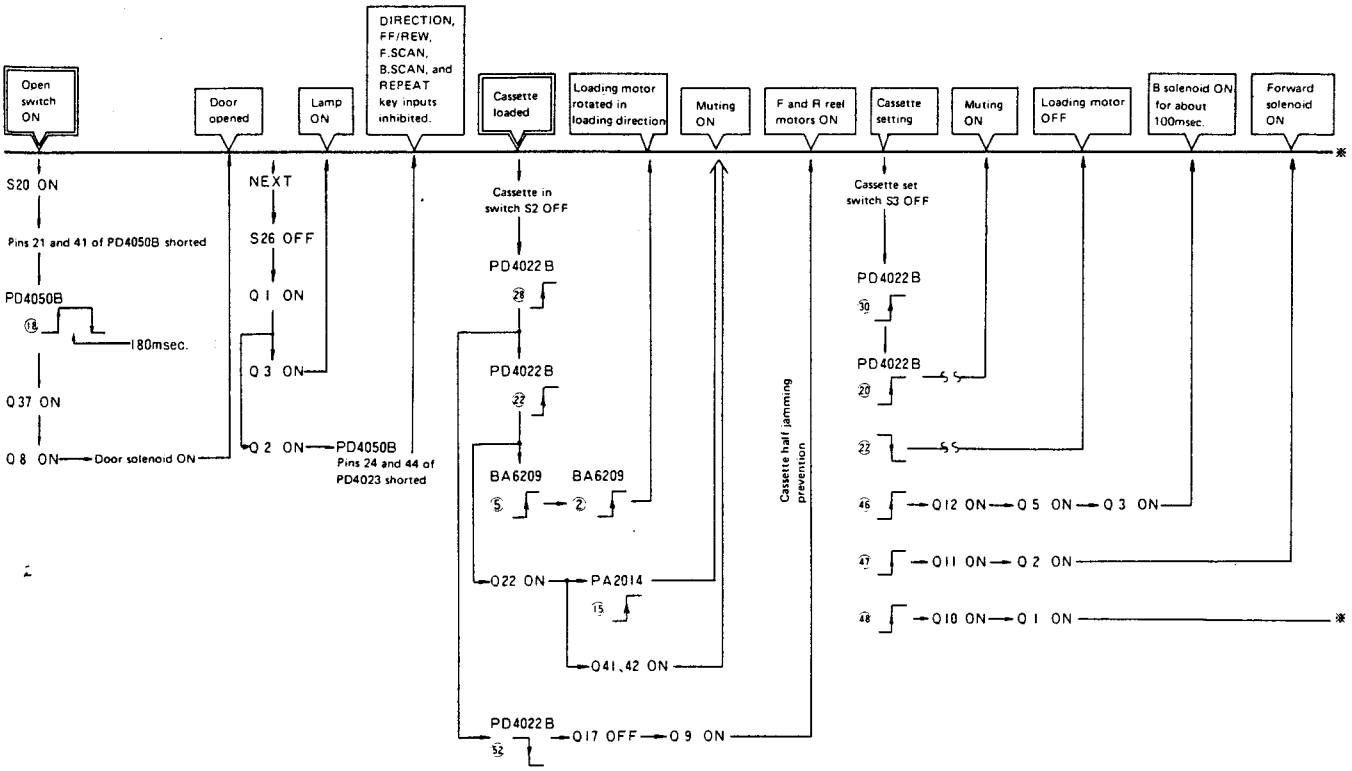


Fig. 32

9.9 CASSETTE LOADING → FORWARD PLAY



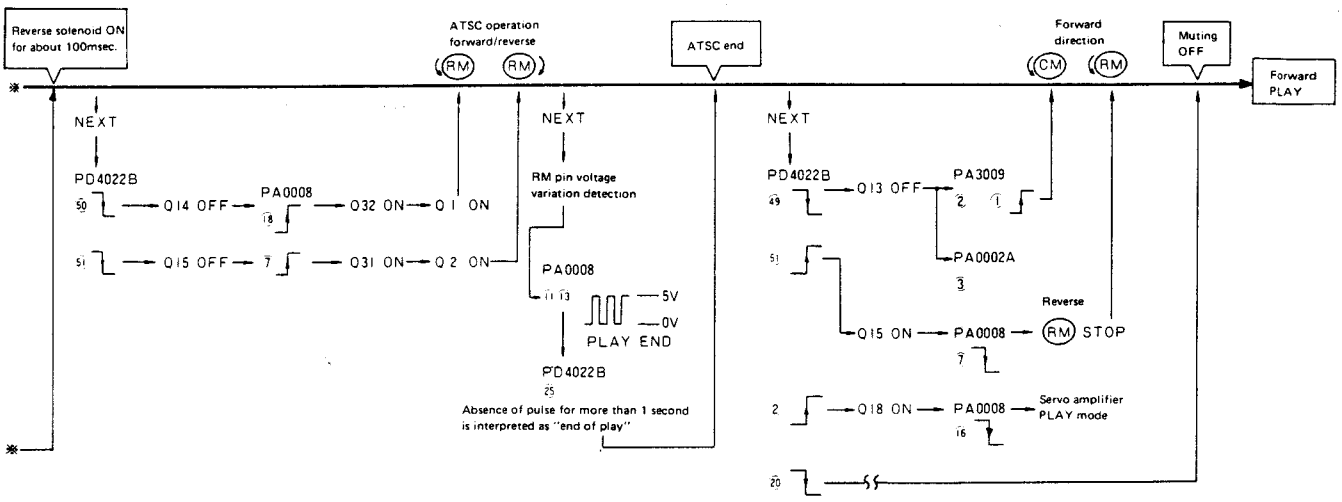


Fig. 33

9.10 FORWARD PLAY → REVERSE PLAY

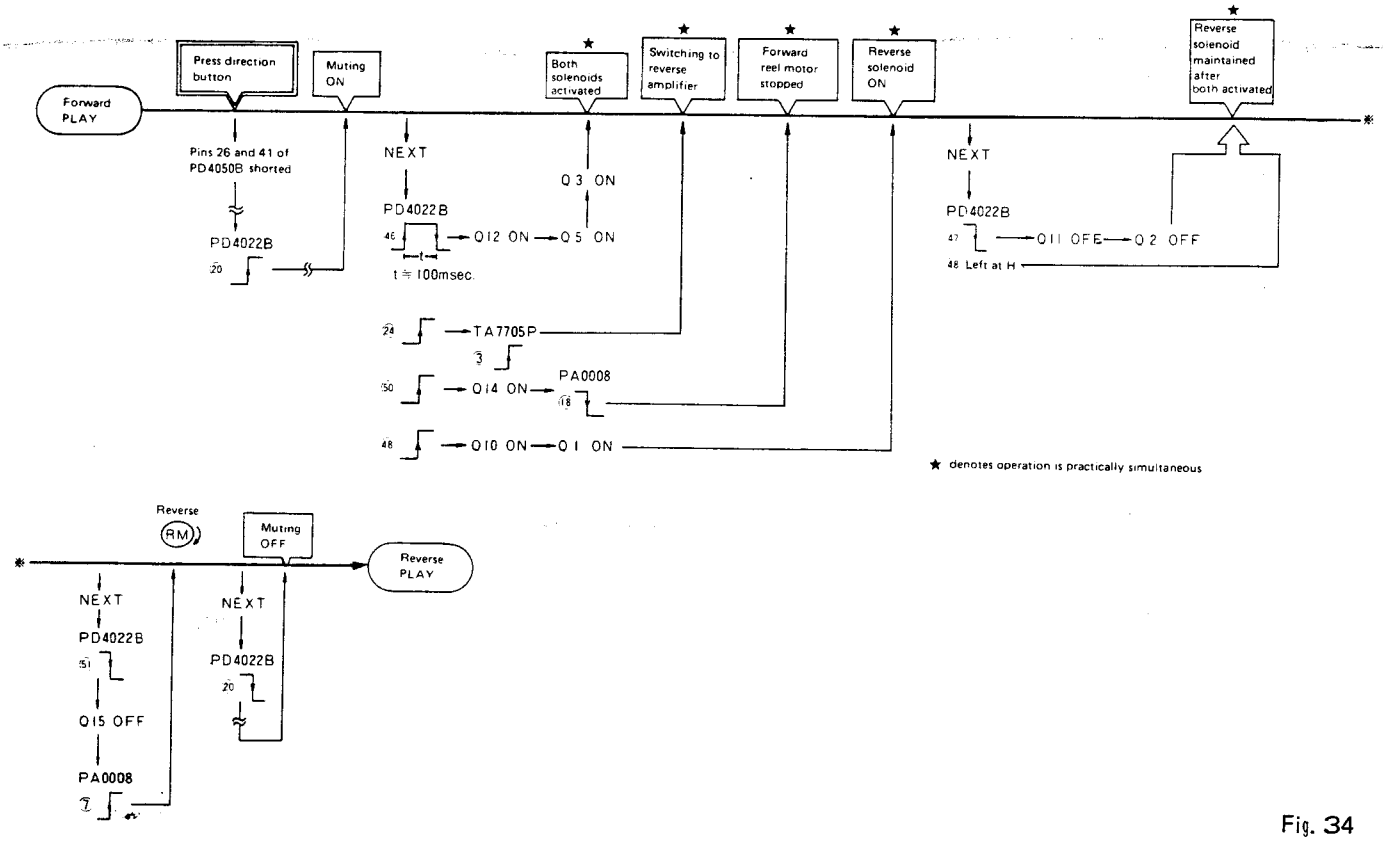


Fig. 34

9.11 FORWARD PLAY → FF

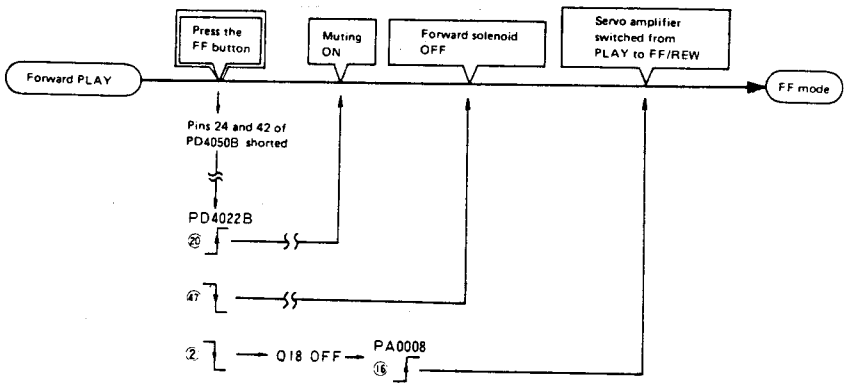


Fig. 35

9.12 FF → F. SCAN

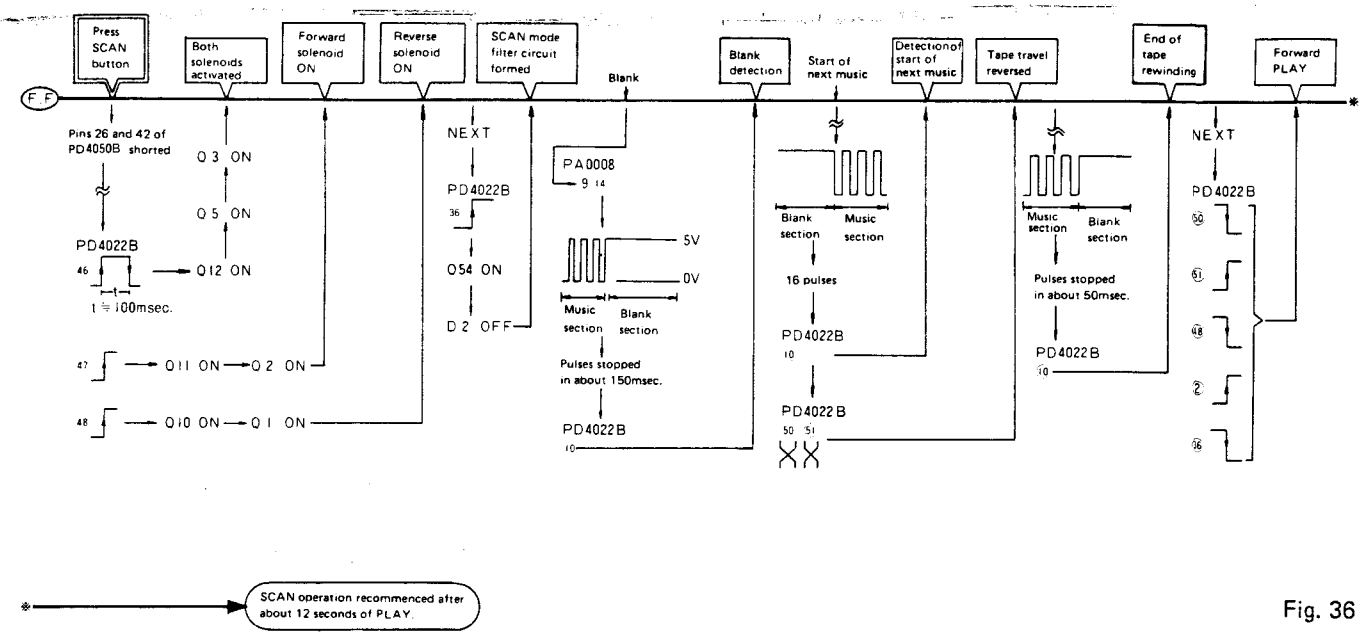


Fig. 36

9.13 MS OPERATION

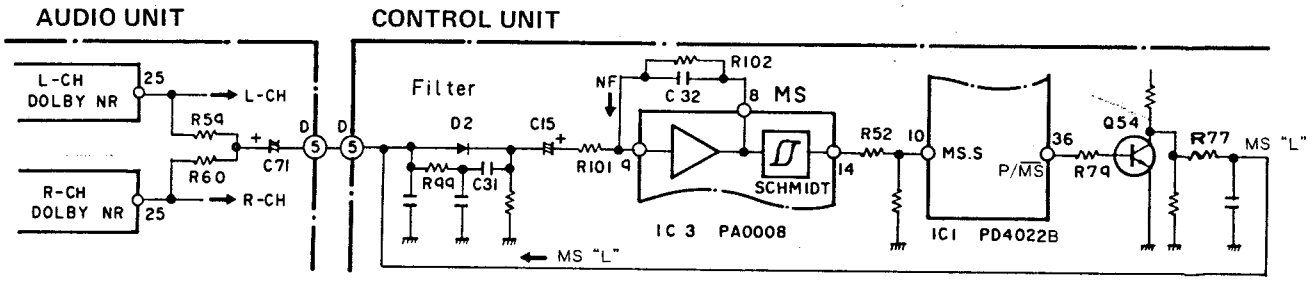


Fig. 37

This circuit is used to detect unrecorded portions of tape. Circuit composition is much the same as the stationary reel base detector circuit.

An LR output signal is generated in the Dolby NR circuit and is passed via a filter circuit to pin 9 of IC3. A Schmidt circuit generates a pulse output synchronized with recorded portions of tape (recorded at above a certain level). The presence/absence of this pulse train is detected in IC4 and is used as the basis for the music selection operation.

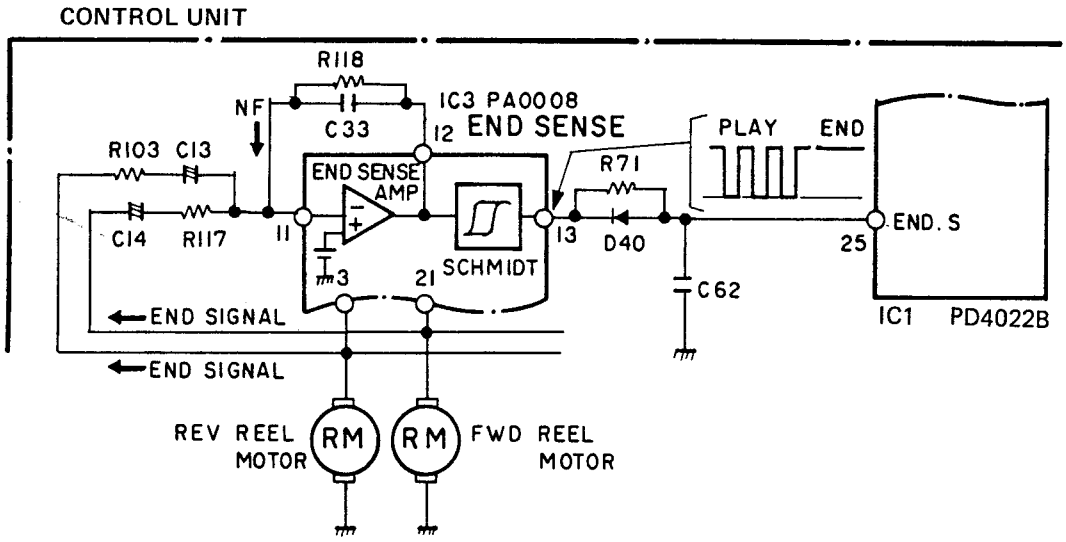
The filter is used to switch the frequency response and gain for music selection at play speed and high speed.

9.14 STATIONARY REEL BASE DETECTION (Fig. 38)

This mechanism detects the fact that both motors have stopped, and is used in detecting the end of tape and the end of ATSC (for taking up tape slack). The circuit consists of a differential high gain END SENSE AMP and a Schmidt circuit block. The END SENSE AMP non-inverted input is fixed at a reference voltage level inside the IC, while the inverted input is passed to an external circuit.

During all modes, current is passed through one motor or the other. And while either motor is operating, the motor pin voltage is changed in synchronization with the brush/commutator switching. When the motors are stationary, the voltage remains at a constant level. In other words, the end of tape condition can be detected by detecting changes in this motor pin voltage.

The motor voltage is AC amplified by the END SENSE AMP, and if the amplified output is greater than the Schmidt circuit hysteresis width, the Schmidt circuit is activated. A pulse output synchronized with changes in the motor pin voltage is generated and passed to IC1. Therefore, the generation of output pulses indicates that the motor is operating, while the absence of pulses indicates that the motor is stationary.



9.15 PLAY MODE

During PLAY mode, constant current is supplied to the motor to generate constant torque in the take-up reel. It (PA0008) includes a PLAY CURRENT setting block which sets the reference current during PLAY mode, CURRENT AMP 21 which compares the motor current with the reference current, and another amplifier CURRENT AMP 22 used for current amplification purposes.

The motor is driven by constant current obtained by a feedback loop which equalizes the voltage drop generated by current (motor current) being passed through R8 with the voltage drop across R108 (reference voltage) generated by passing the reference current through the reference resistance R108.

If, say, the motor current decreases, resulting in the voltage drop across R8 becoming smaller than the voltage drop across R108, a positive input is applied to CURRENT AMP 21 and the output current is amplified. This output current is inverted and amplified by CURRENT AMP 22, resulting in the Q2 base current being amplified. Therefore, the Q2 collector current is also increased, resulting in a larger voltage drop across R8. In this way, the voltage drops across R8 and R108 are kept equal to ensure a constant motor current.

9.16 PLAY MODE REEL MOTOR "OVER SPEED" DETECTION (Fig. 39)

During PLAY mode, the motor is driven by a constant current, the motor rpm speed being controlled by the tape speed achieved at the capstan. If the tape should happen to break, however, thereby eliminating the rpm control, the rpm speed will be accelerated by the PLAY torque, and the motor counter electromotive voltage and pin voltage will increase to a level approaching the circuit supply voltage. This motor voltage is detected by the PLAY MOTOR OVER SPEED DETECTOR block and if it exceeds a reference voltage Vs (approx. 6.5V), a signal is generated at the EJT pin to initiate tape ejection.

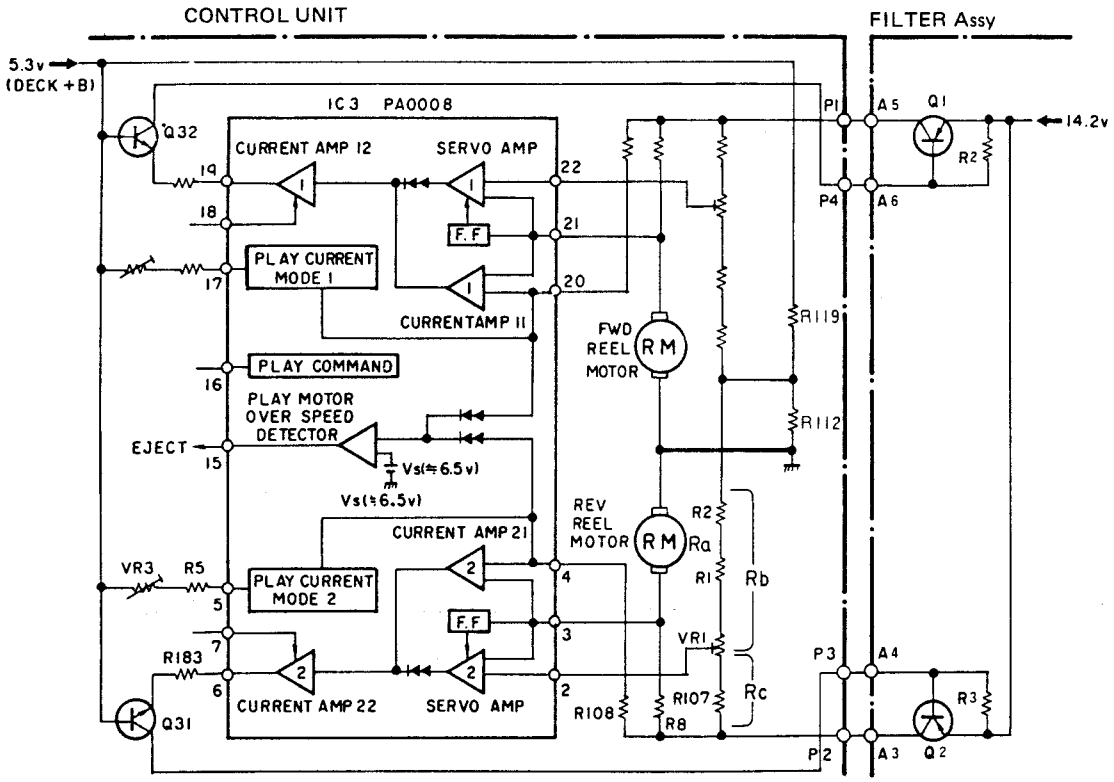


Fig. 39

9.17 FF/REW AND MS MODES

A constant speed servo is applied to the motor during FF and REW modes. And by introducing a slight load gradient, the motor rpm speed is decreased at a fixed rate as the motor load is increased. Consequently, the tape travel speed can be kept at a constant value irrespective of the winding diameter on the take-up reel. The motor speed control in this case is handled by a bridge servo, and for this purpose the IC also includes a differential amplifier SERVO AMP and a CURRENT AMP for amplification of the SERVO AMP output. Externally, the IC is connected to a bridge circuit with the motor armature coil resistance (Ra) forming one of the arms to enable the circuit to detect the motor rpm speed. Constant current from the deck +B line is passed to R112 to generate a reference voltage Vref across that resistor. The bridge resistance values are set so that

$$R8 \times Rb = Ra \times Rc$$

If the motor rpm speed should happen to decrease, resulting in a motor counter electromotive voltage Ea lower than the reference voltage Vref, a positive voltage is applied to the servo amplifier input to amplify the output from that amplifier. This output is inverted and amplified by CURRENT AMP 22, resulting in the Q2 base current also being amplified. The collector current is consequently amplified and the motor is accelerated. The motor counter electromotive voltage Ea is thereby increased as the motor rpm speed is increased. In other words, the motor finally settles down at a constant rotational speed where Ea and Vref are practically equal.

In this arrangement, however, there is no decrease in rpm speed when the motor load is increased. For this reason, the bridge balance is offset a little (that is, R8 x Rb is set to a value lower than Ra x Rc) to enable error to be generated in the bridge detector voltage when the motor current is increased (as a result of the increasing load).

In other words, the apparent motor counter electromotive voltage Ea is increased in response to load increases, thereby enabling a decrease in the motor rpm speed to be achieved. The same mechanism takes effect during MS mode.

9.18 CAPSTAN MOTOR CONTROL

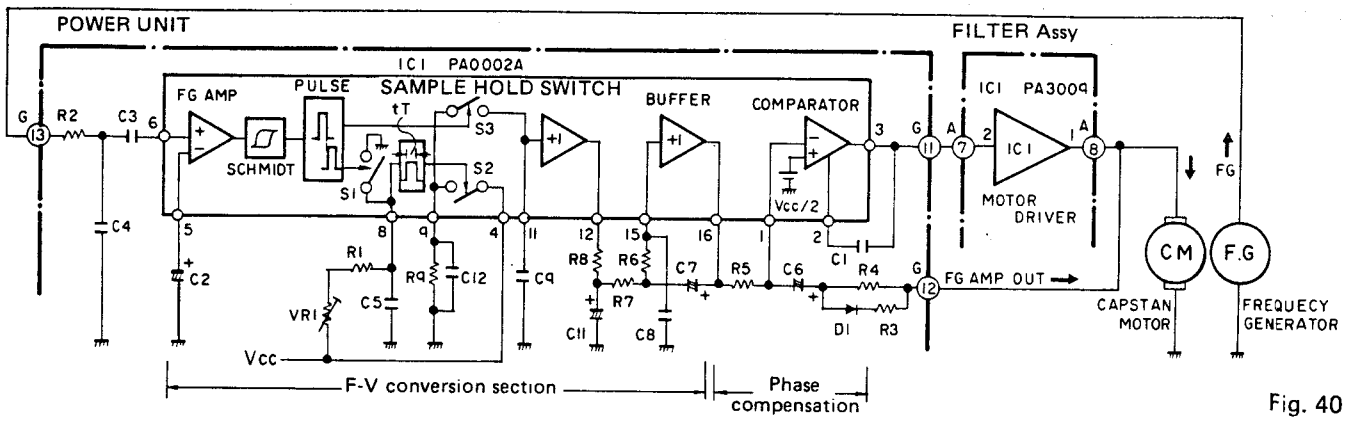


Fig. 40

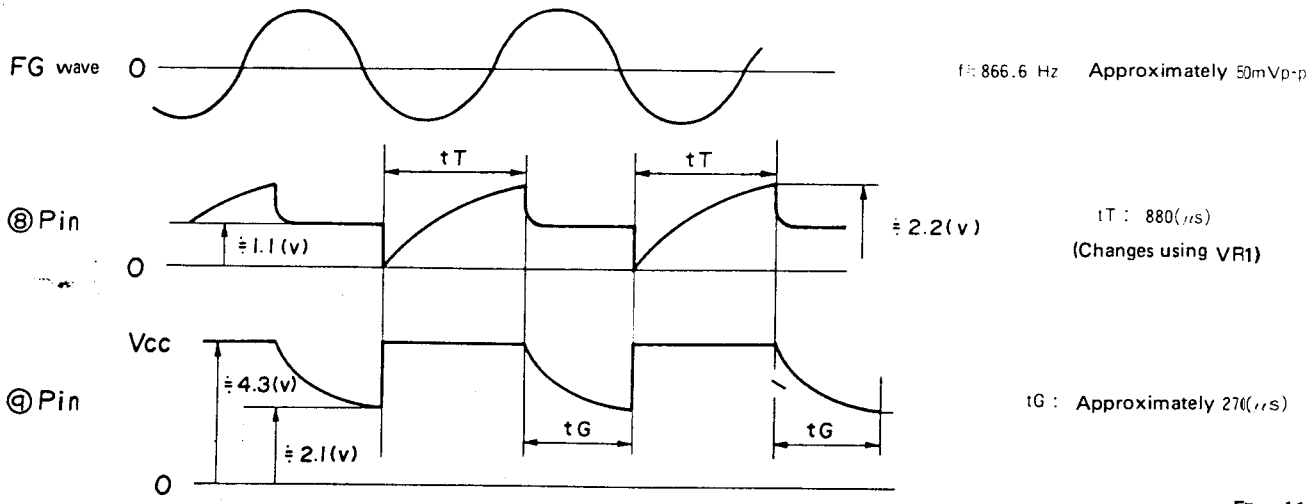


Fig. 41

The signal from the motor FG (Frequency Generator) is amplified by the FG AMP and passed to the wave forming Schmidt circuit where a complete pulse is formed. The trailing edge of that pulse is used to form the first pulse, while the trailing edge of the first pulse is used in turn to form the second pulse. The first pulse is used to switch the sample hold switch (S3) ON, and the second pulse is used to increase F – V sensitivity, thereby switching the discharge switch (S1) ON in the circuit which forms constant time intervals by use of a charging/discharging circuit.

The second pulse is applied to a later stage charging/discharging circuit to switch S1 ON/OFF. Pin 8 is charged up according to the time constant determined by C5 and R1 + VR1, and when the Schmidt circuit threshold is exceeded, the Schmidt circuit is inverted. When S1 is switched ON, the charge on C5 is discharged instantly, thereby inverting the Schmidt circuit again. With S1 being switched ON and OFF like this, the Schmidt circuit connected to the charging/discharging circuit generates constant interval pulses, and the next stage S2 is switched ON during this fixed interval.

When S2 is switched ON, C12 is charged up to Vcc instantly. And when S2 is switched OFF, the charge on C12 is discharged according to the time constant determined by C12 and R9. Since S3 is switched ON by the first pulse while C12 is still being discharged, the voltage information at pin 9 is transferred to C9. This is followed immediately by S3 being switched OFF, and S1 and S2 being switched ON in succession, thereby charging C12 up immediately to the Vcc level again. This operation is repeated over and over.

Although the widths of the first and second pulses remain unchanged if motor rotation is speeded up, the Schmidt circuit output pulse frequency is increased. In other words, since the first and second pulse cycle periods are reduced, the S2 OFF interval is shortened. This means that C12 is discharged for a shorter period of time,and the resultant higher voltage is transferred to C9.

Since negative characteristics apply between pin 11 and the motor pin, an increase in the C9 voltage results in the motor speed being decreased, thereby enabling the speed to be controlled.

To prevent C9 discharging beyond pin 11, the discharge voltage is passed through a high impedance buffer section and through to a comparator amplifier. With a reference voltage of Vcc/2 in the comparator section, the inverted input voltage is compared, and any increase or decrease in voltage is used to control the motor speed.

If the inverted input voltage is greater than the reference voltage, a negative voltage is applied to reduce the comparator output current, thereby slowing down the motor speed. Hence, since the motor will operate at maximum speed if the C9 charging quantity (comparator inverted input) is 0, there is no need for a special activator circuit when the power supply is activated. The amount of charge on C9 is about Vcc/2 when constant tape travel speed is reached.

Rpm speed can be adjusted by VR1. If the resistance is lowered, the C5 charging time constant is decreased, resulting in S2 being ON for a shorter period of time (and being OFF for a longer period of time). Therefore, a smaller charging voltage transferred to C9, and the motor speed is subsequently increased.

9.19 PROTECTOR CIRCUITS

Protector circuits are used to guard against the following five problems.

1. If the tape should happen to break during PLAY mode and reel motor "runaway" condition is detected, tape operations are stopped for two seconds before switching to ATSC operation.
2. If the ATSC operation is not completed within ten seconds, ATSC is suspended and tape operations are halted. The cassette tape is then ejected, and normal operation can be resumed if another cassette tape is loaded.
3. If the end of tape is detected four times within ten seconds, the deck is stopped to protect the mechanism. Normal operations can be resumed by pressing the TAPE button.
4. Transmission data error detection
   The system featured in this deck involves constant transfer of data between four ICs.
   If noise is generated in the data transmission line resulting in data transfer error, the deck and tuner are both stopped for two seconds and then restored to the condition prior to the generation of noise.

   Note: If the deck or tuner is switched to scanning, frequency UP/DOWN, start of tape search etc just before generation of the transfer error, that selected operation is not restored after the two second stop. Instead, the deck is restarted in PLAY mode, and the tuner is returned to "last direction" reception.
5. If cassette loading or unloading operation takes more than the normal two seconds, the current operation is reversed (that is, unloading is changed to loading, and loading is changed to unloading). If the cassette is caught somewhere, and neither ejection nor insertion is possible after switching to loading and unloading mode three times, the deck is stopped.

9.20 LEVEL DIAGRAM

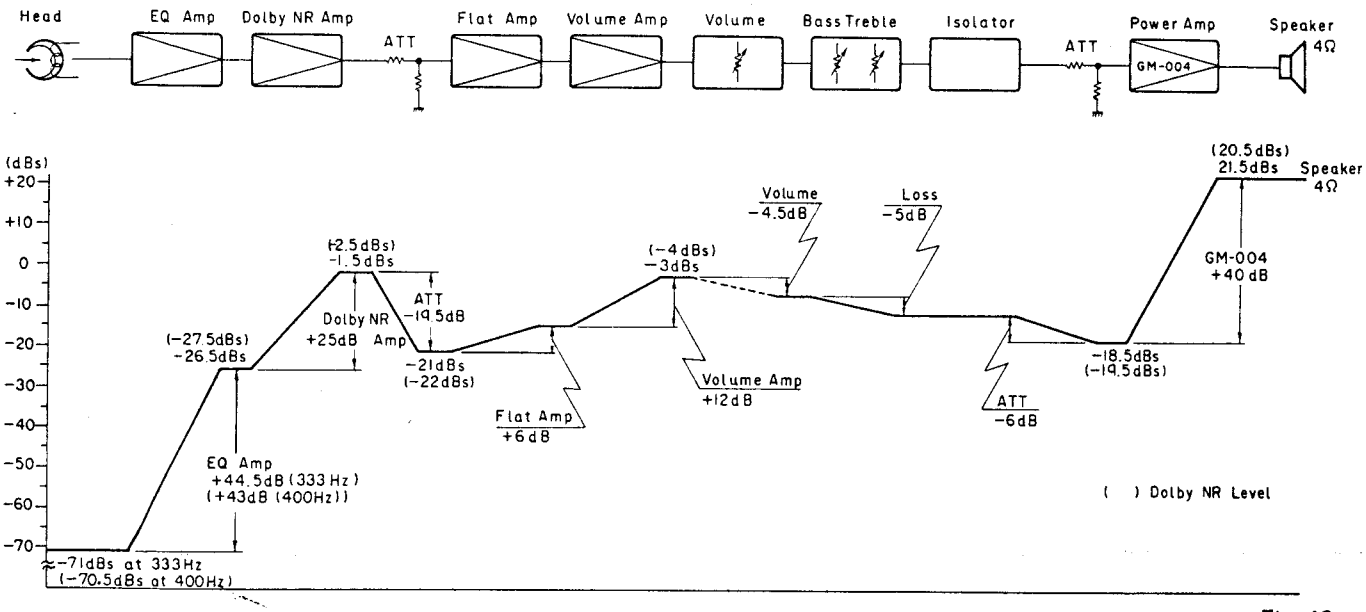
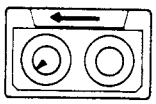
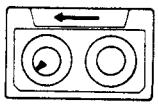
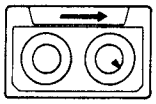
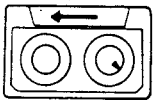
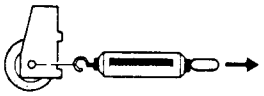


Fig. 42

10. ADJUSTMENT

10.1 CHECK POINTS OF CASSETTE MECHANISM

Confirm the following items when replacing parts of the cassette mechanism.	■ Clearance between flywheel and flywheel bracket: 0.1 ~ 0.2 mm	■ Wow and flutter: Less than 0.25% (RMS) Less than 0.12% (WRMS) Using an STD-301A, measure the wow and flutter at the start and end of winding and take the maximum value. If values indicated by the pointer vary considerably, adjust to 70% of the minimum and maximum values. Measuring time shall be 5 ~ 6 seconds.
■ Fast forward and rewinding time: 120 ± 20 seconds Using an C-60, set to fast forward and rewind, and measure the time with a stop watch.	■ Winding torque: 35 ~ 44g·cm  Using a cassette type torque meter (120 g.cm), measure the minimum value while in the play mode. Measuring time shall be 5 ~ 6 seconds.	■ F.F torque: More than 60g.cm  Using a cassette type torque meter (160 g.cm), measure the value when the tope stops in the F.F. mode.
■ REW torque: More than 60g.cm  Using a cassette type torque meter (160 g.cm), measure the value when the tape stops in the REW mode.	■ Back tension torque: 1 ~ 2.5g.cm  After setting in the REW mode wihtout loading a cassette tape for 5 minutes, measure the back tension torque in the play mode, using a cassette type torque meter.	■ Pinch roller pressure: 220 ~ 280g  Measure the pressure with a tension meter (1 kg) at the point when the rotor stops rotating at the center of the pinch roller.
■ Cassette loading force: Less than 1,000g		

10.2 AZIMUTH ADJUSTMENT

- **To Adjust**

1. Playback STD-341A (10kHz, −20dB) and adjust the azimuth to obtain maximum output for both forward and reverse directions.
2. If the difference between forward and reverse is great, adjust to the midpoint of both directions.
3. After adjustment, lock in position using tightening screw.

10.3 DOLBY NR LEVEL ADJUSTMENT

- **Connection Diagram**

Switch position
Dolby NR switch ..... OFF

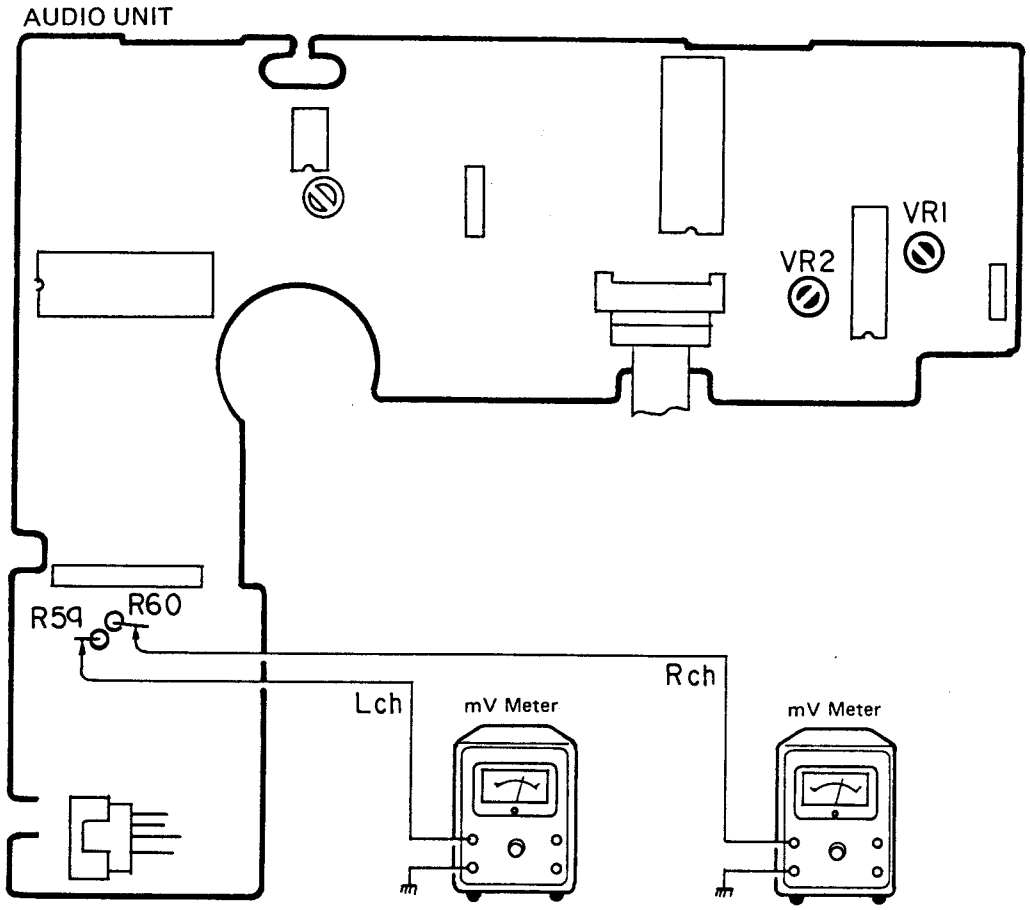


Fig. 43

- **To Adjust**

1. Playback the 400Hz, 200nwb/m portion of CT-150, and adjust VR1 (left channel) and VR2 (right channel) to obtain a millivoltmeter reading of 580mV (−2.5dBs). The adjusting accuracy is ± 1dBs.

10.4 TAPE SPEED ADJUSTMENT

- **Connection Diagram**

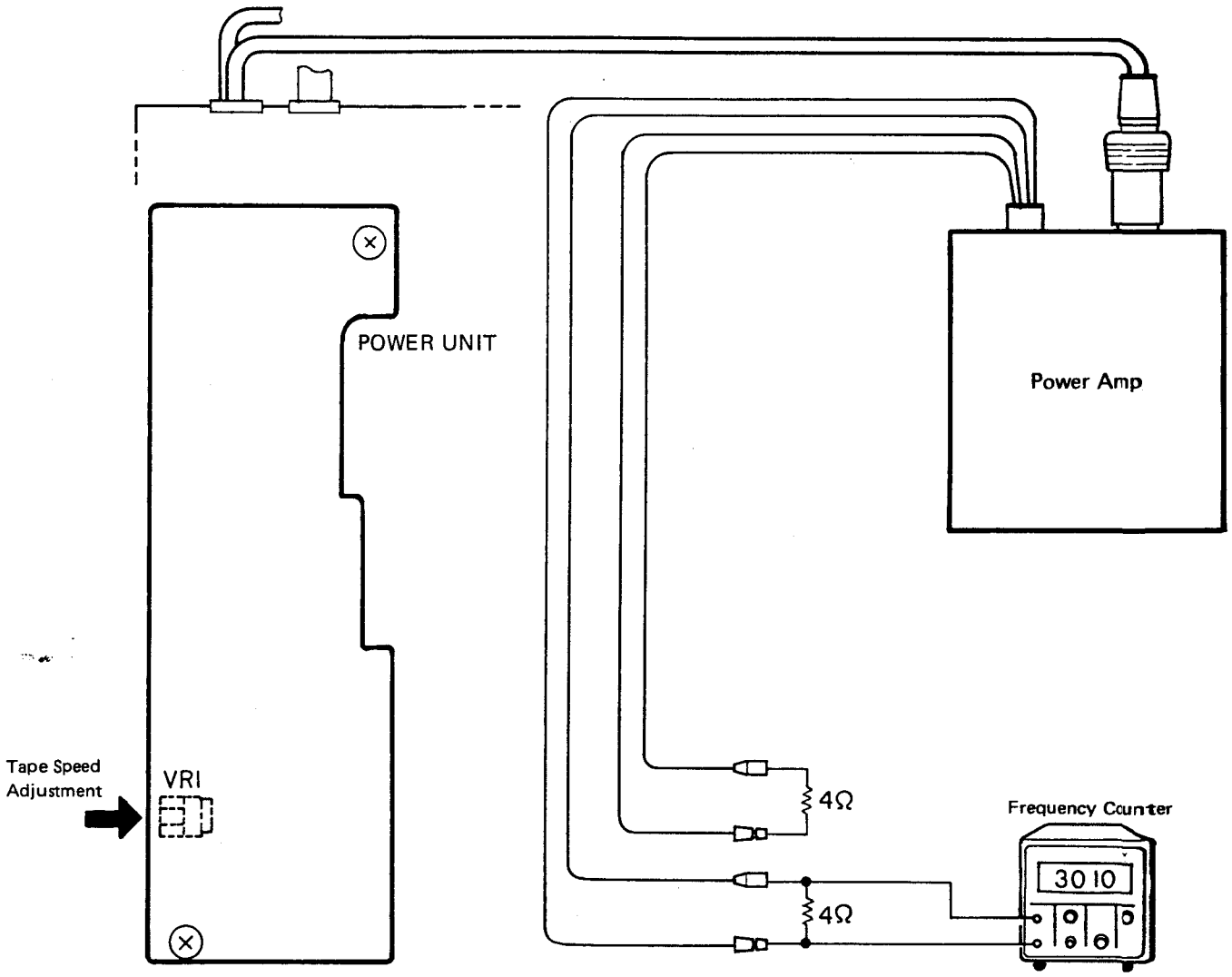


Fig. 44

- **To Adjust**

1. Playback STD-301 (3 kHz, −10dB) and adjust VR1 so that the frequency counter shown 3,010 Hz ± 30 Hz.

10.5 PLAY TORQUE ADJUSTMENT

- **Connection Diagram**

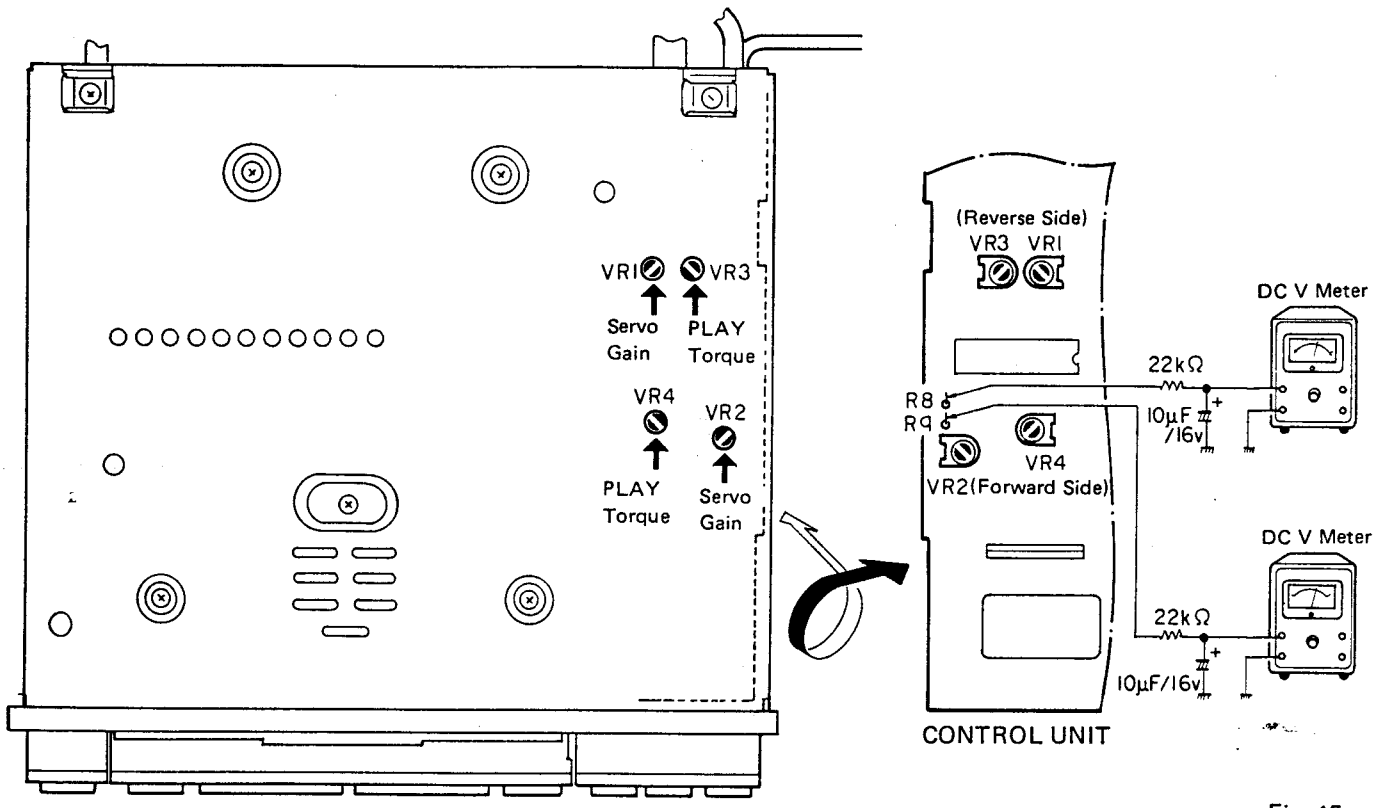


Fig. 45

- **To Adjust**

1. Playback a regular cassette tape (such as C-60), and adjust VR4 (forward) and VR3 (reverse) to obtain a reading of 4.0V ± 0.2V in the DC voltmeter.
2. Using a cassette type torque meter (120g-cm), check that the forward and reverse torque lies between 35 and 44g-cm.

10.6 SERVO GAIN ADJUSTMENT

- **Connection Diagram**

(Shown in Fig. 45)

- **To Adjust**

1. Connect a frequency counter to R59 of the audio unit.
2. Playback CT-910 at the MS speed in the forward direction, and adjust VR2 to obtain a frequency counter reading of 2,200Hz ± 300Hz. (2,400Hz ± 300Hz . . . . . FX-K9B/EW)
3. Rewind the table back to the beginning of the recorded signal section, and then take the tape out and reload it in reverse.
4. Play the tape in reverse at the MS speed and adjust VR1 to again obtain a reading of 2,200Hz ± 300Hz in the frequency counter.
5. With the tape in ATSC mode, check that DC voltmeter readings of 7V are obtained in both the forward and reverse directions.

10.7 ELECTRONIC VOLUME CONTROL ADJUSTMENT

- Connection Diagram

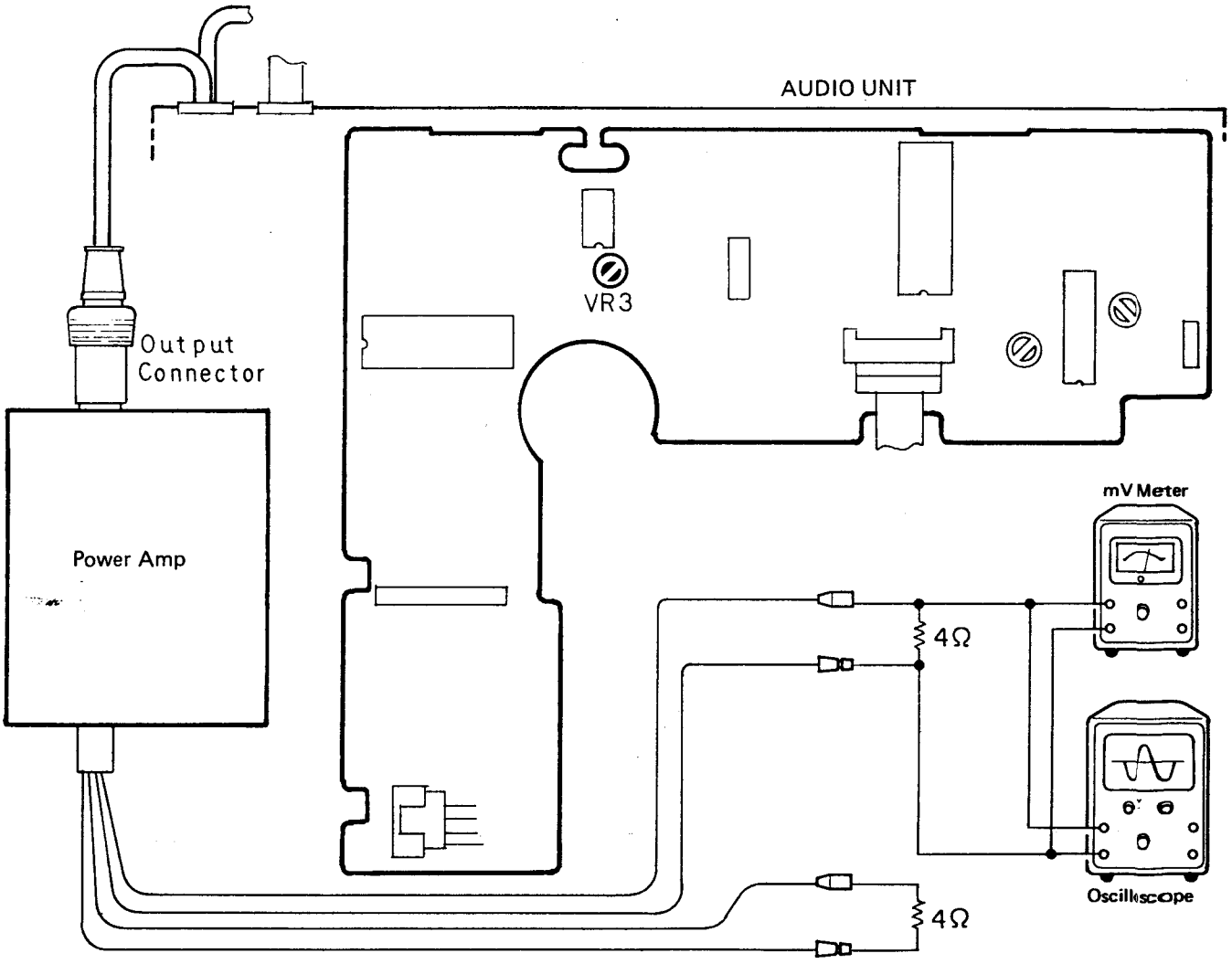


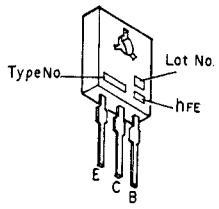
Fig. 46

- To Adjust

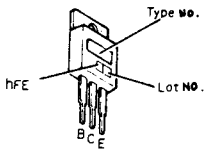
1. Turn VR3 fully around clockwise.
2. Playback STD-341A (333Hz, −20dB) and press the electronic UP volume control to adjust to maximum volume. Check that the output is not subjected to clipping at this time.
3. Then press the electronic DOWN volume control four times, and adjust VR3 so that the output level at this time is 1.5dB ± 1dB below the maximum volume level.
4. Check that a maximum output volume level of at least +5dBs is attained.

ICs and Transistors

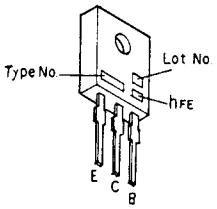
2SA900



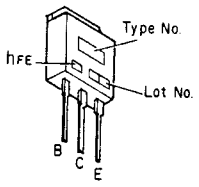
2SD1062



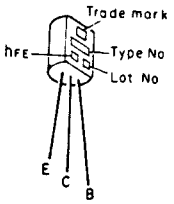
2SC1568



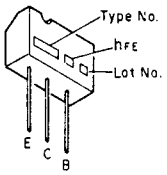
2SB952



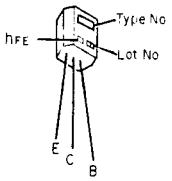
2SC2634NC



2SA937F
2SC2021F

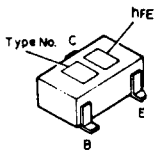


2SA1048
2SC3113

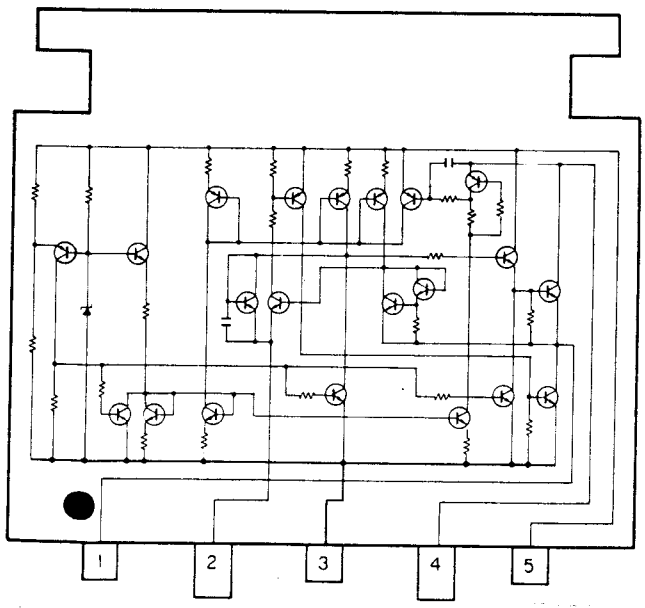


CHIP TRANSISTORS

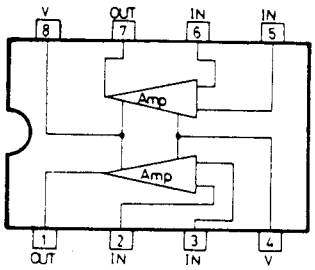
Part No.	Indication (Type No., hFE)
2SA1179-M5	M5
2SA1179-M6	M6
2SA1179-M7	M7
2SB709-AQ	AQ
2SB709-AR	AR
2SB709-AS	AS
2SC2712-LG	LG
2SC2712-LL	LL
2SC2712-LY	LY
2SD601-YQ	YQ
2SD601-YR	YR
2SD601-YS	YS
2SB779-R	1AR
2SB779-S	1AS



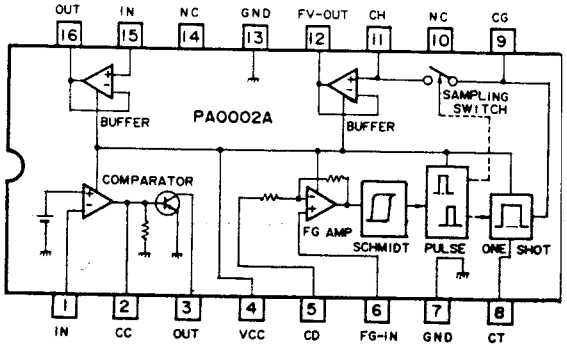
PA3009



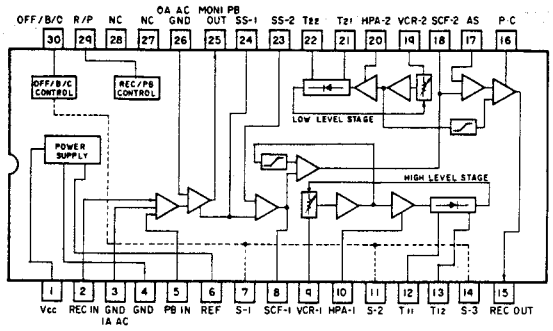
TA75558P



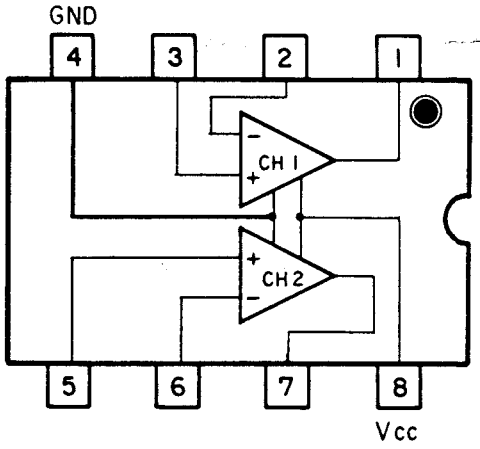
PA0002A



PA3017



HA17358

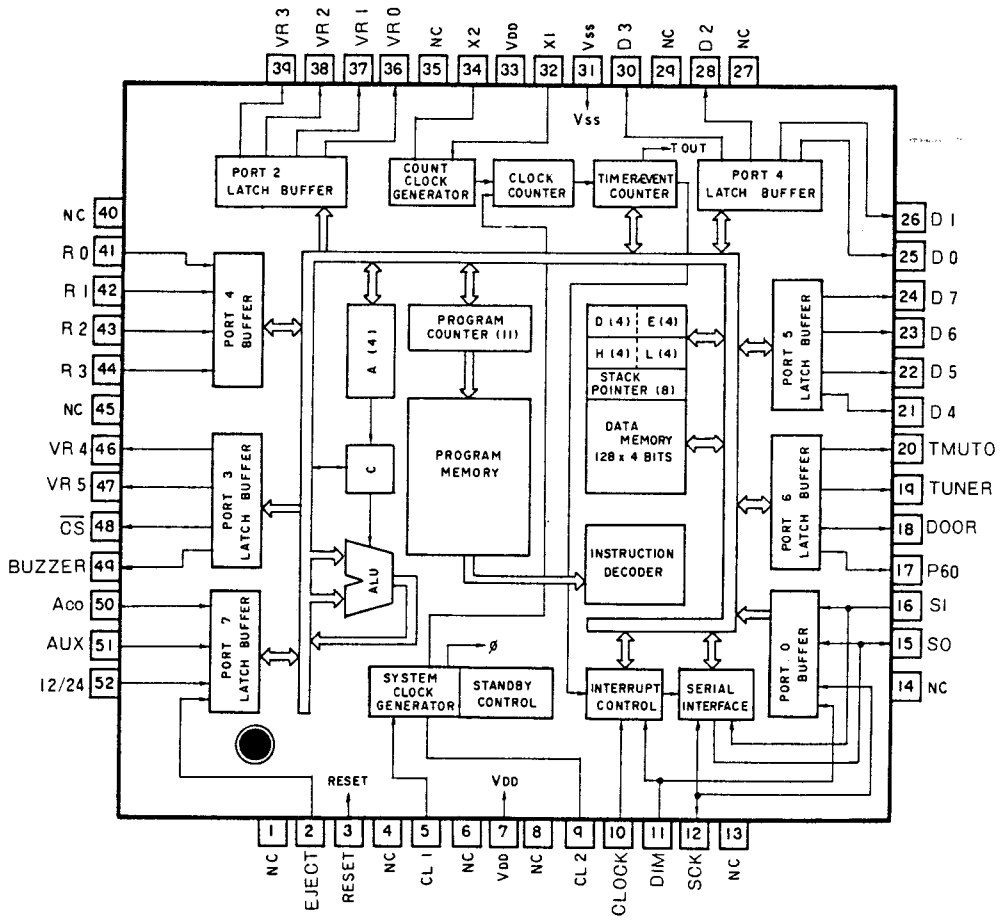


Pin Functions (PA3017)

Pin No.	Pin Name	I/O	Function and Operation
1	Vcc		+B
2	REC IN	Input	Recording signal input
3	IA AC GND		Input amplifier inverted input
4	GND		
5	PB IN	Input	Playback signal input
6	REF		Reference pin
7	S-1		High level stage, side-chain filter selector switch
8	SCF-1		High level stage, side-chain filter pin
9	VCR-1		High level stage, VCR pin
10	HPA-1		High level stage, high-pass amplifier output
11	S-2		Time constant selector switch
12	T11		Time constant pins
13	T12		
14	S-3		Time constant selector switch
15	REC OUT	Output	Encoder output
16	P.C		Phase compensation capacitor
17	AS		Antisaturation network
18	SCF-2		Low level stage, side-chain filter pin
19	VCR-2		Low level stage, VCR pin
20	HPA-2	Output	Low level stage, high-pass amplifier output
21	T21		Low level stage, time constant pins
22	T22		
23	SS-2		Spectrum skewing pins
24	SS-1		
25	MON P.B OUT	Output	Monitor & decoder output
26	OA AC GND	Input	Output amplifier inverted input
27	NC		
28	NC		
29	R/P		Recording/playback mode control. "H" for REC.
30	OFF/BIG		Dolby NR mode control

● *PD4050B

*IC's marked by *are MOS type.*
Be careful in handling them because they are very liable to be damaged by electrostatic induction.



Pin Functions

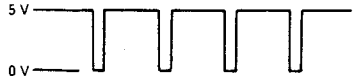
Pin No.	Pin Name	I/O	Function and Operation
1	NC		
2	EJECT	Input	EJECT input from reel motor control IC. Active "H".
3	RESET	Input	CPU hardware reset input. Active "H".
4	NC		
5	CL 1		System clock generator circuit CR connection pins. (200kHz)
6	NC		
7	VDD		Power supply pin
8	NC		
9	CL2		System closck generator circuit CR connection pins. (200kHz)
10	CLOCK	Input	100Hz input from PD4022B.
11	DIM	Input	Small lamp input.
12	SCK	Input Output	Serial interface serial clock input/output pin.
13、14	NC		
15	SO	Output	Serial interface data output pin
16	SI	Input	Serial interface data input pin
17	P60	Output	Universal output port (not used) (FX-K9B/EW, FX-K9/EW). SK alarm output (FX-K9SDK/WG).
18	DOOR	Output	Door opening output port. Active "H".

Pin No.	Pin Name	I/O	Function and Operation
19	TUNER	Output	"H" level when tuner is ON.
20	TMUTO	Output	"H" output pin when tuner is switched on and off independently.
21	D 4	Output	Key input strobe output pins. Active "H". (D6 is not used FX-K9B/EW, FX-K9/EW)
22	D 5	Output	
23	D 6	Output	
24	D 7	Output	
25	D 0	Output	
26	D 1	Output	
27	NC		
28	D 2	Output	Key input strobe output pin. Active "H".
29	NC		
30	D 3	Output	Key input strobe output pin. Active "H".
31	Vss		GND
32	X 1	Input	Counter clock input pin (32.768kHz)
33	VDD		Power supply pin.
34	X 2		X'tal connection pin.
35	NC		
36~39	VR 0 ~ VR 3	Output	Volume data output pins. Active "H".
40	NC		
41~44	R 0 ~ R 3	Input	Key input return input pins.
45	NC		
46、47	VR 4 、 VR 5	Output	Volume data output pins. Active "H".
48	$\overline{CS}$	Output	PD7005 chip selector signal output pin. Active "L".
49	BUZZER	Output	Buzzer drive clock output pin. 3.8kHz
50	ACC	Input	Accessory key ON/OFF input pin. "H" when ON.
51	AUX	Input	AUX ON/OFF input pin. ON when "H".
52	$\overline{12}$/24	Input	12/24 hour display switching input pin. 12-hour when "L".

*Check the following items to determine whether PD4050B is operating or not.

1. Approximately 5V should be applied to pins 7 and 33.
2. Pin 3 should be at "L", but not connected to GND. 5V should be applied to pin 3 when the CLEAR button is pressed.
3. Approximately 5V should be applied to pin 50.
4. An oscillator output of about 200kHz should be applied to pin 9.
5. The following output waveforms should be observed at the respective pins (data transmission).

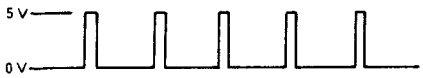
Pin 12、16



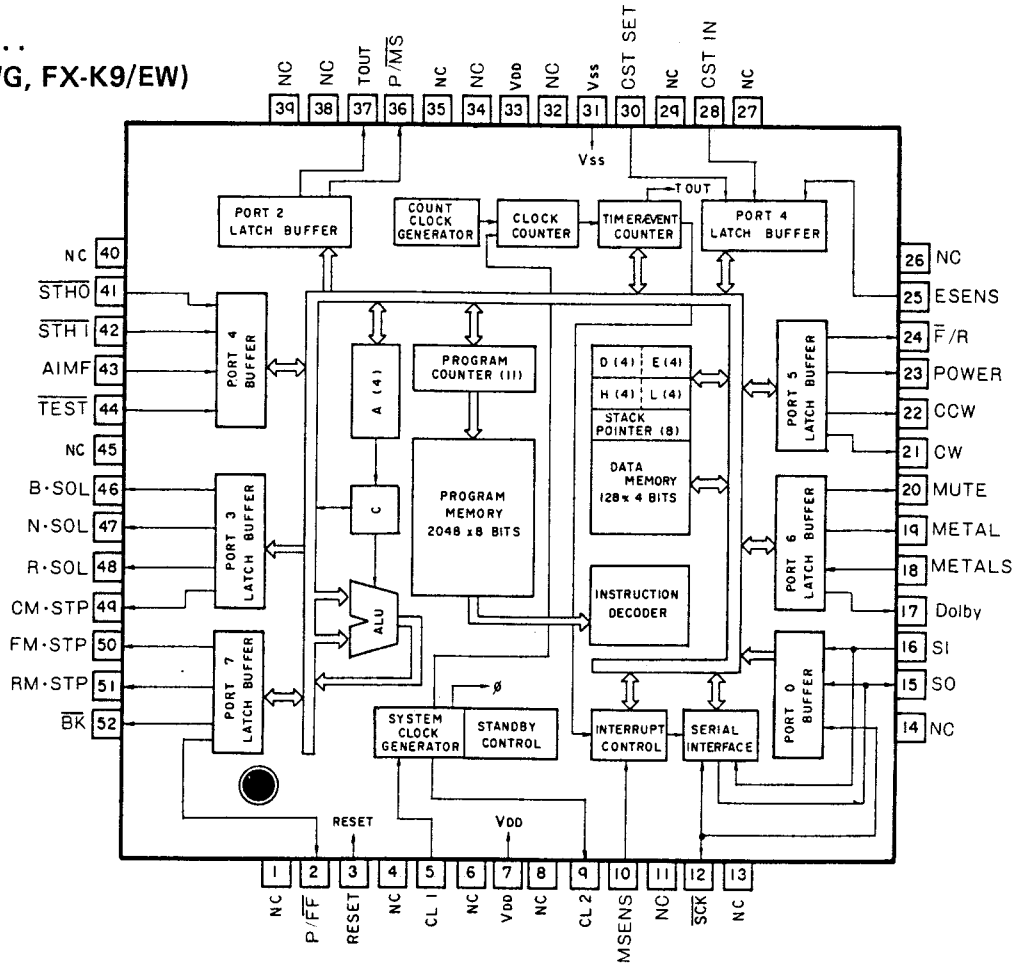
Pin 15

(Matrix Circuit)

Pin 21、22、24~26、28、30

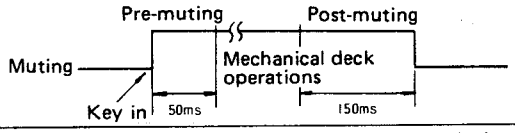


● *PD4022B
(PD4022A . . . . .
FX-K9SDK/WG, FX-K9/EW)



Pin Functions

Pin No.	Pin Name	I/O	Function and Operation
1	NC		
2	P/$\overline{FF}$	Output	Reel motor servo IC PA0008 servo switching output. "H" level during PLAY mode, "L" level during FF, REW, and MS modes.
3	RESET	Input	Reset input. Program is started from address 0 when "H" level is applied temporarily to this pin.
4	NC		
5	CL I	Input	Reference clock generator input.
6	NC		
7	VDD		Power supply.
8	NC		
9	CL2	Output	Reference clock generator input.
10	MSENS	Input	MS operation audio signal input pin. Music and blank sections of tape judged according to deck operating status.
11	NC		Normally GND.
12	$\overline{SCK}$	Input Output	Synchronizing clock pin for serial data transfer. This pin is used by alternate input/output switching for transmitting and receiving purposes. Receiving: To accept external sync clock, this pin is switched to input mode, and SI pin data is read by the rising edge of this pin. Transmitting: Switched to output mode where output data is passed to the SO pin by the falling edge of this pin.
13, 14	NC		

Pin No.	Pin Name	I/O	Function and Operation
15	SO	Output	Data output pin for serial data transfer.
16	SI	Input	Data input pin for serial data transfer.
17	Dolby	Output	Dolby NR circuit control output pin. OFF: "L" level B: "H" level C: High impedance
18	METALS	Input	Auto chrome detector switch input pin. "H" level output obtained from METAL pin when "H" level is applied to this pin. (Only operates during ATSC mode).
19	METAL	Output	Equalizer circuit time constant switching output pin. The output differs according to the METALS pin input. (Only operates during ATSC mode, the output normally being held).
20	MUTE	Output	Audio muting output for prevention of noise during mechanical deck operations. Output is at "L" level during PLAY and when released, , and at "H" level during FF, REW, and MS modes, and when mechanical deck changes occur. Pre-muting and post-muting functions are also included. The output changes as shown in the diagram. 
21	CW	Output	Loading motor control output. "H" level output generated when loading mechanism is switched to EJECT operation.
22	CCW	Output	Loading motor control output. "H" level output generated when loading mechanism is switched to LOADING operation.
23	POWER	Output	Deck audio circuit power supply ON/OFF switching control pin. "H" level output generated deck and LOADING operations.
24	$\overline{F}$/R	Output	Head amplifier direction switching signal output. "L" level for forward, "H" level for reverse.
25	ESENS	Input	End detection reel motor rotation pulse input pin. End is "detected" when "H" level is applied continuously for one second.
26、27	NC		
28	CST IN	Input	Loading operation switching input pin. If there is no cassette in the tape transport mechanism (pin 30 at "L" level) LOADING is started when "H" level is applied to this pin. And if "L" level is applied to this pin during EJECT operation, EJECT operation is stopped.
29	NC		
30	CST SET	Input	Loading operation switching input pin. If "H" level is applied to this pin during LOADING operation, the LOADING operation is stopped and deck operations are commenced. And if the pin is switched to "L" level during EJECT operation, deck operations are stopped.
31	Vss		GND
32	NC		Normally GND.
33	VDD		Power supply pin. 5V ± 10%
34、35	NC		
36	P/$\overline{MS}$	Output	MS operation filter switching output pin. "H" level for PLAY mode, "L" level for FF, REW, and MS modes.
37	TOUT	Output	System controller reference signal output pin. During PD4022 operation, a 100Hz, 50% duty output signal is generated.
38～40	NC		
41、42	$\overline{STH0}$、$\overline{STH1}$	Input	SCAN short time hold duration setting input pins. The hold duration is the number of seconds obtained by adding 12 to the data read from these pins.
43	AIMF	Input	Input pin for selecting the AIMF automatic "beginning of music" locating function where MS mode is started automatically at the end of ATSC with playback always started from the beginning when the deck is started.

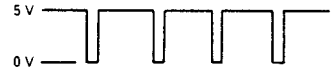
Pin No.	Pin Name	I/O	Function and Operation
44	$\overline{\text{TEST}}$	Input	Test mode selector input pin. TEST mode is activated when the pin is reset by connecting to GND, and (0101) appears at all output pins.
45	NC		
46	B·SOL	Output	Forward/reverse solenoid activator driver output pin.
47、48	F·SOL、R·SOL	Output	Forward/reverse solenoid activator output pins. An "H" level output is generated when a solenoid is activated.
49	CM·STP	Output	Capstan motor control output pin. Capstan motor is stopped by "H" level output. "H" level output is generated only during ATSC, resulting in the capstan motor being stopped.
50	FM·STP	Output	Forward direction reel motor control output pin. Reel motor is stopped by "H" level output.
51	RM·STP	Output	Reverse direction reel motor control output pin. Reel motor is stopped by "H" level output.
52	$\overline{\text{BK}}$	Output	Brake output pin. A 500ms "L" level output is generated when reel motor is switched from high speed FF and REW modes to low speed PLAY mode.

Mechanical status	N · SOL	R · SOL
FF, REW, release	L	L
Forward PLAY	H	L
Reverse PLAY	L	H
MS	H	H

*Check the following items to determine whether PD4022 is operating or not.

1. Approximately 5V should be applied to pins 7 and 33.
2. Pin 3 should be at "L", but not connected to GND. 5V should be applied to pin 3 when the CLEAR button is pressed.
3. An oscillator output of about 200kHz should be applied to pin 9.
4. The following output waveforms should be observed at the respective pins (data transmission).

Pin 12、16



Pin 15

●PA0008

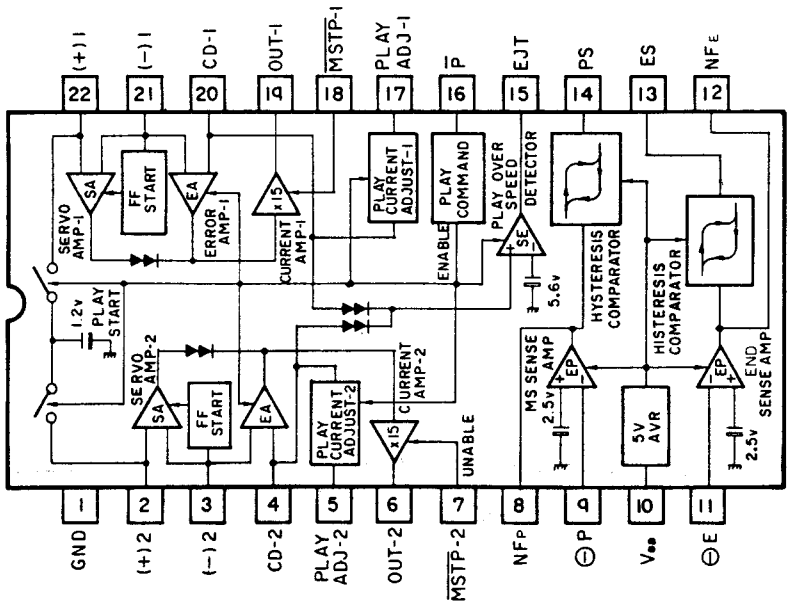
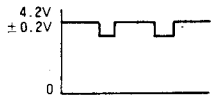
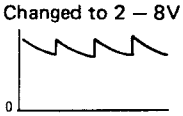
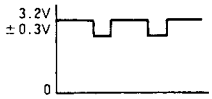
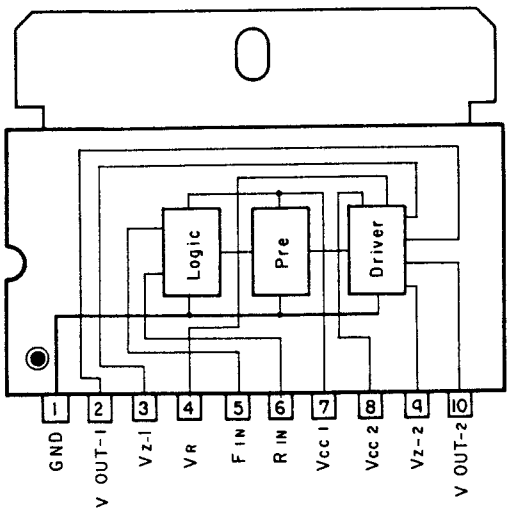


fig. 29

Pin Functions (PA0008)

Pin No.	Pin Name	I/O	Function and Operation
1	Vss		GND
2	(+) 2	Input	Servo amplifier non-inverted input pin. (Corresponds to reverse motor). PLAY mode  MS, FF, REW modes  Changed to 2 – 8V (Proportional to winding diameter)
3	(–) 2	Input	Servo amplifier inverted input pin. (Corresponds to reverse motor). (Operational waveforms and voltages are the same as for the (+)2 pin).
4	CD-2		Constant current in respect to external resistors during PLAY mode. PLAY mode 
5	PLAY ADJ-2	Input	Motor current during PLAY mode set by external resistance. PLAY mode: 1.4 to 1.7V (constant) MS, FF, REW modes: 2.5 to 5V
6	OUT-2	Output	Reverse motor drive transistor base driver. PLAY mode: 2.5 to 4V MS, FF, REW modes: 2.5 to 4.3V
7	$\overline{\text{MSTP-2}}$	Input	Reverse motor STOP input pin. Motor stop mode: 0V Motor running mode: 0.7 to 1.0V
8	NF-P	Output	MUSIC signal amplifier output pin. A fixed voltage of about 2.5V is obtained when there is no MUSIC, while a amplified waveform centered at 2.5V appears when there is MUSIC.
9	⊖P	Input	MUSIC signal amplifier input pin used during music search mode.
10	Vcc		Power supply pin.
11	⊖E	Input	END SENSING amplifier input pin.
12	NF-E	Output	END SENSING amplifier output pin, A constant voltage of about 2.5V is generated when the forward and reverse motors are stopped, while an amplified waveform of the motor ripple voltage centered about 2.5V appears when one or both motors is/are turning.
13	ES	Output	END SENSING schmidt circuit output pin. Pulse waveforms of about 5V at "H" level and of about 0V at "L" level are generated synchronized with the motor ripple voltage while the motors are rotating. When both motors have stopped, "H" level is generated.
14	PS	Output	MUSIC SENSING schmidt circuit output pin. Pulse waveforms of about 5V at "H" level and of about 0V at "L" level are generated synchronized with the motor ripple voltage while music is detected during PLAY and MS modes. "H" level is generated during other modes.
15	EJT	Output	EJECT output pin for motor "runaway" status during PLAY mode. A constant current output is obtained if a motor "runaway" condition occurs during PLAY mode.
16	$\overline{\text{P}}$	Input	PLAY mode switching input pin. Approx. 0V is applied during PLAY mode, and about 10V during other modes.
17	PLAY ADJ-1	Input	Same function and operation as pin 5, but for forward motor.
18	$\overline{\text{MSTP-1}}$	Input	Forward motor stop input pin. Voltage is same as at pin 7.
19	OUT-1	Output	Same function and operation as pin 6, but for forward motor.
20	CD-1		Same function and operation as pin 4, but for forward motor.
21	(–) 1	Input	Same function and operation as pin 3, but for forward motor.
22	(+) 1	Input	Same function and operation as pin 2, but for forward motor.

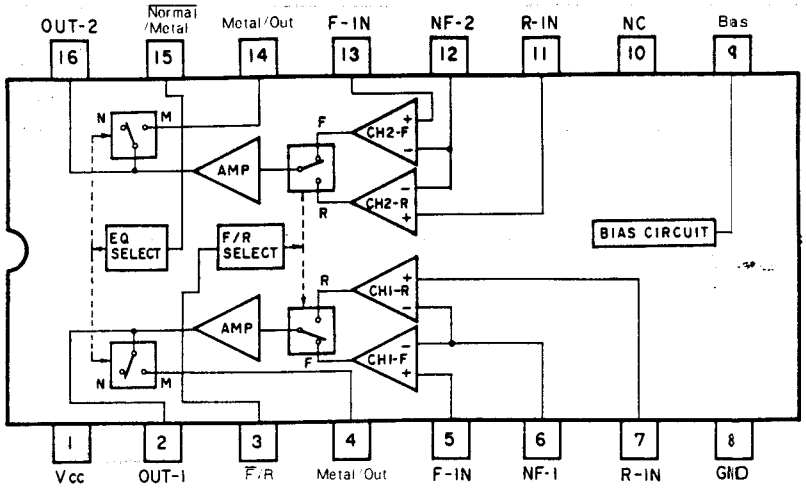
BA6209



Pin Functions (BA6209)

Pin No.	Pin Name	I/O	Function and Operation
1	GND		
2	Vout-1	Output	Motor pin.
3	Vz-1		Output delay pin.
4	V_R		Motor voltage control pin.
5	F IN	Input	Motor rotating direction setting input. Load.
6	R IN	Input	Motor rotating direction setting input. Eject.
7	Vcc 1		Power supply.
8	Vcc 2		Power supply.
9	Vz-2		Output delay pin.
10	Vout-2	Output	Motor pin.

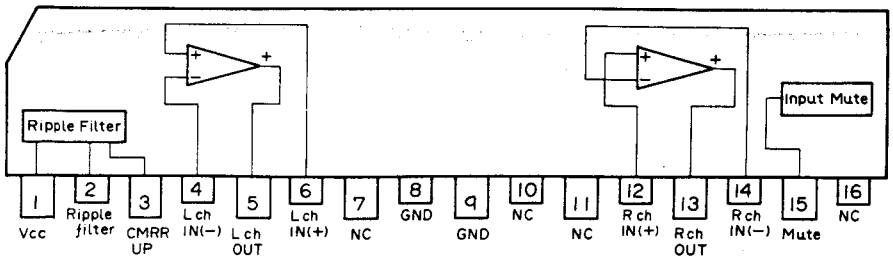
TA7705P



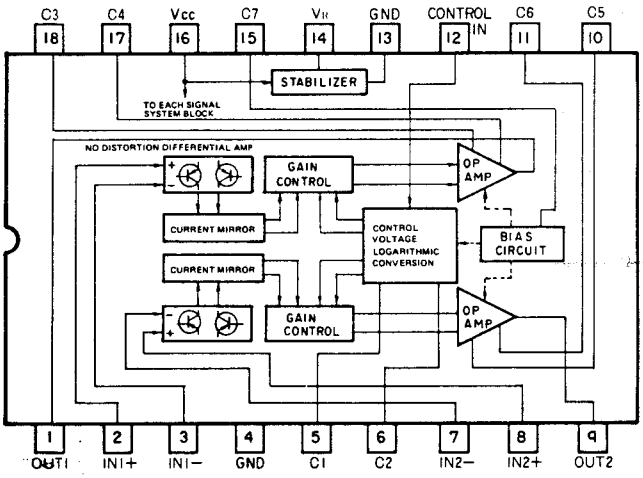
Pin Functions (TA7705P)

Pin No.	Pin Name	I/O	Function and Operation
1	Vcc		+B
2	OUT-1	Output	Left channel output.
3	$\overline{F}$/R		F/R switching pin (reverse at "H" level).
4	Metal/Out		METAL pin (left channel).
5	F-IN	Input	RL input.
6	NF-1		NF (left channel).
7	R-IN	Input	FL input.
8	GND		
9	Bias		Input bias pin.
10	NC		
11	R-IN	Input	FR input.
12	NF-2		NF (right channel).
13	F-IN	Input	RR input.
14	Metal/Out		METAL pin (right channel).
15	$\overline{\text{Normal}}$/Metal		METAL selector pin (METAL at "H" level)
16	OUT-2	Output	Right channel output.

PA2014



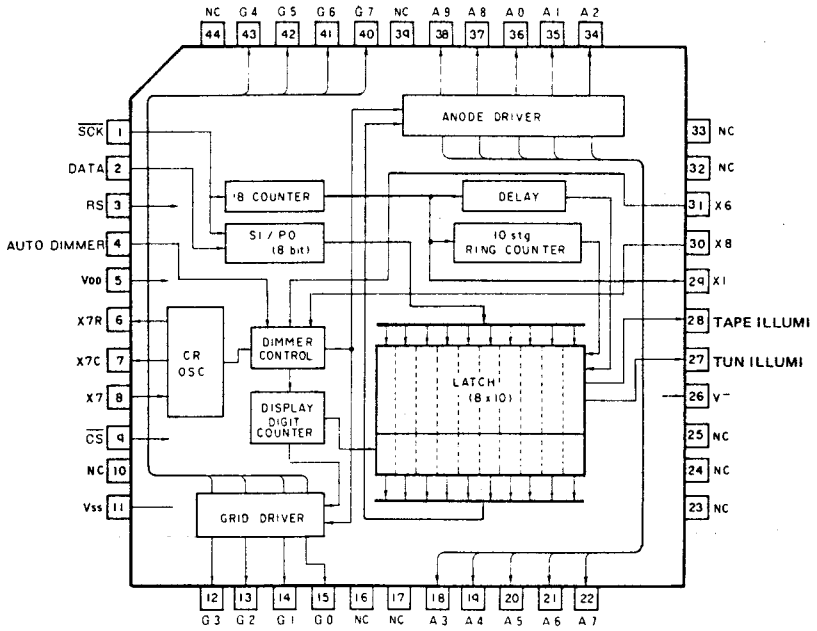
PA0005A



Pin Functions (PA0005A)

Pin No.	Pin Name	I/O	Function and Operation
1	OUT 1	Output	Channel 1 output
2	IN 1 +	Input	Channel 1 differential inputs
3	IN 1 −	Input	
4	GND		GND
5	C 1		Bypass capacitors for the control voltage logarithmic conversion circuit
6	C 2		
7	IN 2 −	Input	Channel 2 differential inputs
8	IN 2 +	Input	
9	OUT 2	Output	Channel 2 output
10	C 5		Channel 2 output amplifier phase compensation
11	C 6		
12	CONTROL IN	Input	Control voltage input
13	GND		GND
14	V_R		For stabilized circuits
15	C 7		Bias circuit filter
16	Vcc		Vcc
17	C 4		Channel 1 output amplifier phase compensation
18	C 3		

*PD7005



Pin Functions (PD7005)

Pin No.	Pin Name	I/O	Function and Operation
1	$\overline{SCK}$	Input	Serial interface system clock input pin. Active "L".
2	DATA	Input	Data input pin
3	RS		Reset pin
4	AUTO DIMMER		Not used
5	VDD		Power supply pin. 5V ± 0.3V
6 ~ 8			For oscillator circuit
9	$\overline{CS}$	Input	Chip selector signal input pin. Active "L".
10	NC		
11	Vss		GND
12~15	G3~ G0	Output	FL grid outputs
16、17	NC		
18~22	A3~A 7	Output	FL anode outputs
23~25	NC		
26	V−	Output	Grid output. Negative voltage Output pin for pull-down resistance.
27	TUN ILLUMI.	Output	TUN illuminator ON output pin ("H" level)
28	TAPE ILLUMI.	Output	TAPE illuminator ON output pin ("H" level)
29~31			Not used
32、33	NC		
34~36	A2~A0	Output	FL anode outputs
37、38	A8、A9	Output	
39	NC		
40~43	G7~G4	Output	FL grid outputs
44	NC		

ELECTRICAL PARTS LIST (FX-K9SDK/WG)

Control Unit (CWX-529) (FX-K9SDK/WG)

MISCELLANEOUS

Mark	Symbol & Description	Part No.
★★	IC1	PD4022B or PD4022A
★★	IC2	PD4050B
★★	IC3	PA0008
★★	IC4	PA2014
★★	Q1, Q2, Q6, Q7	2SA900
★★	Q3	2SD1062
★★	Q5	2SC1568
★★	Q8	2SB952
★★	Q9	2SC2634NC
★★	Q10 – Q15, Q17 – Q23, Q25, Q30 – Q42, Q45 – Q54, Q58 Chip Transistor	2SC2712-LG or 2SC2712-LL or 2SC2712-LY or 2SD601-YQ or 2SD601-YR or 2SD601-YS
★★	Q16, Q24, Q26 – Q29, Q56, Q57 Chip Transistor	2SB709-AQ or 2SB709-AR or 2SB709-AS or 2SA1179-M5 or 2SA1179-M6 or 2SA1179-M7
★	D1 – D4, D9 – D12	US1040 or 1S1555 or 1S2076
★	D5	1S1886 or SIB01-01 or SIB01-02
★	D6, D7	RD6R8JB3
★	D8, D14 Chip Diode	MA151A
★	D13, D16 Chip Diode	MA153
★	D15 Chip Diode	MA3043
★	D17, D19, D20, D24 Chip Diode	MA151WK
★	D18, D22, D25, D33 – D36, D38 – D42 Chip Diode	MA151K
★	D21, D26, D31 Chip Diode	MA3062
★	D23, D29 Chip Diode	MA3047
★	D27, D37 Chip Diode	MA3100
★	D28 Chip Diode	MA151WA
★	D30 Chip Diode	MA3200
★	D32 Chip Diode	MA3091
	L1 Transformer	CTX-073
	L2 Ferri-Inductor	CTF-078
	PO1 Posistor	CCX-010
	VC1 Trimmer	CCG-070
★★	VR1, VR2 Semi-fixed, 1kΩ (B)	CCP-239
★★	VR3, VR4 Semi-fixed, 3.3kΩ (B)	CCP-242
	X1 Buzzer	CPV-031
	X2 X'tal	CSS-029

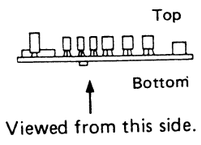
RESISTORS

Mark	Symbol & Description	Part No.
	R1 – R4 5.1kΩ	CCN-099
	R5, R6 2.7kΩ	CCN-110
	R7, R116, R208	RD1/4VM □□□J
	R8, R9	RD1/4PM □□□J
	Other Resistors (Chip Resistor)	RS1/8S □□□J

CAPACITORS

Mark	Symbol & Description	Part No.
	C1 – C4, C15	CEA010M50L2
	C5, C17	CEA471M10L2
	C6, C16	CEA100M16L2
	C7, C8	CEA2R2M50L2
	C9, C10	CEA0R1M50L2
	C11 – C14	CEA010M35NP
	C18	CEA331M16L2
	C19	CEA330M35LL
	C20	CEA101M35L2
	C21	CEA2R2M35LS
	C22, C52 Chip Capacitor	CKSYB102K50
	C23, C27 – C30 Chip Capacitor	CKSYF473Z50
	C24, C34, C44 Chip Capacitor	CCSCH330J50
	C25, C26 Chip Capacitor	CKSYF154Z25
	C31 Chip Capacitor	CKSYB682K50
	C32 Chip Capacitor	CCSCH560J50
	C33 Chip Capacitor	CKSYB272K50
	C35 Chip Capacitor	CKSYB472K50
	C36 – C42, C45 – C48, C53 – C61 Chip Capacitor	CKSYB222K50
	C49, C64 Chip Capacitor	CKSYB223K50
	C50, C51 Chip Capacitor	CCSSL102J50
	C62 Chip Capacitor	CKSYB473K25
	C63	CEA470M6R3LS

- Parts mounted onto the control unit are listed separately in the following manner.
  Page 55: Chip parts installed on the bottom of P.C. board.
  Page 57: Parts other than the chip parts installed on the bottom.



Viewed from this side.

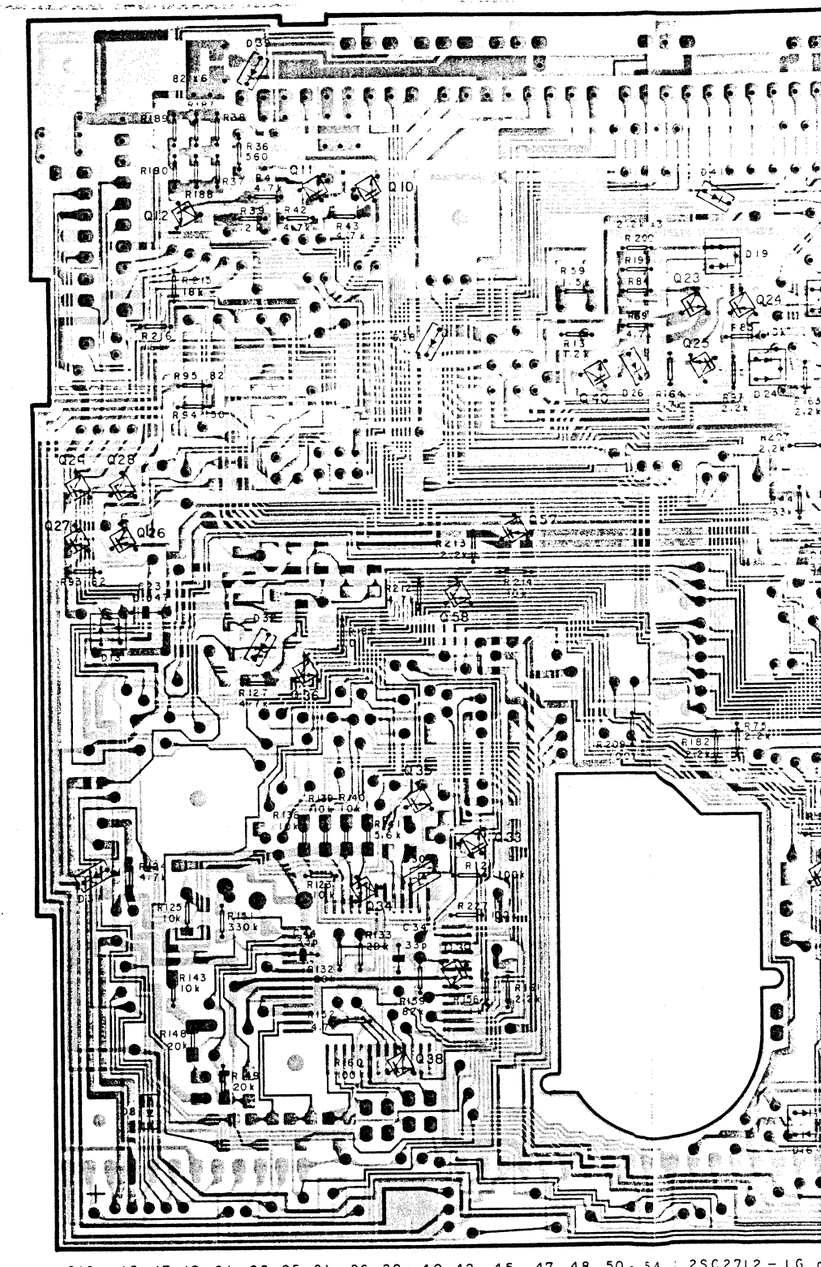
Chip Transistor

Chip Diode

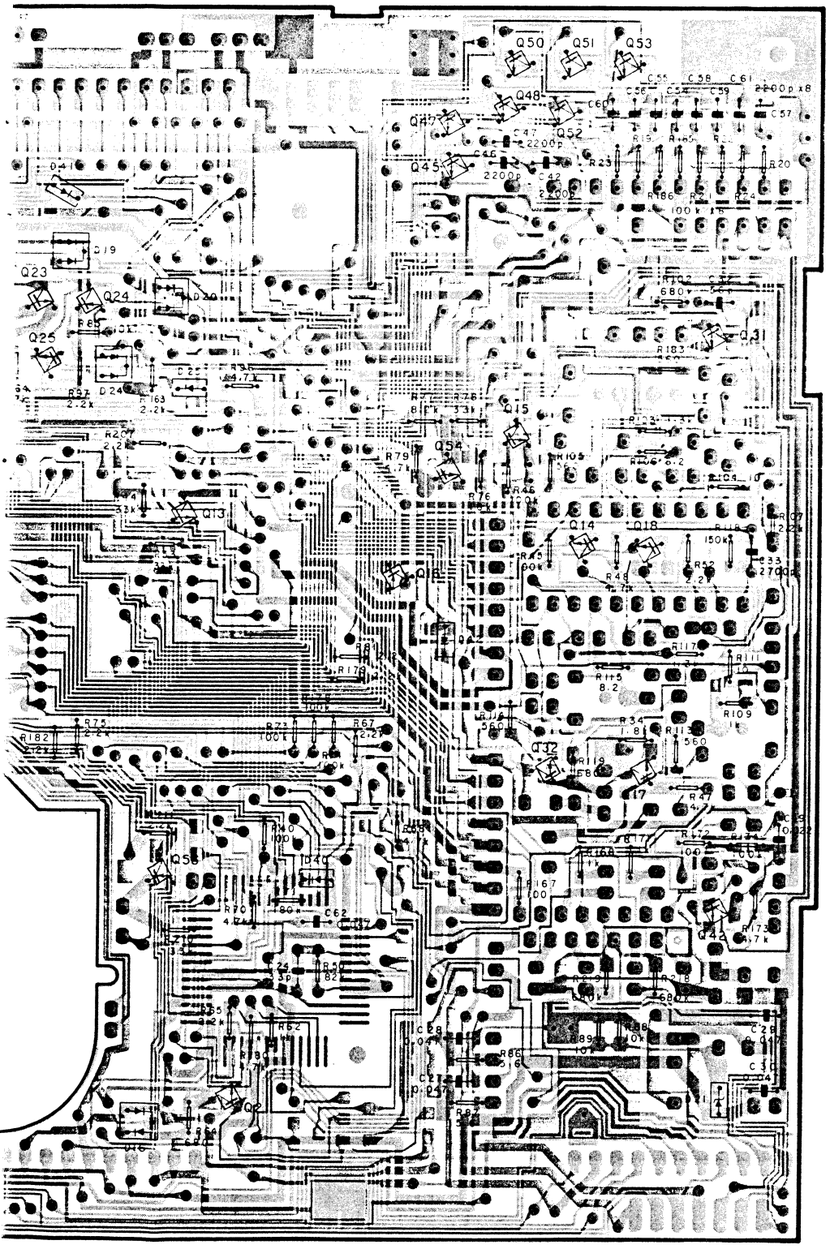
Chip Resistor

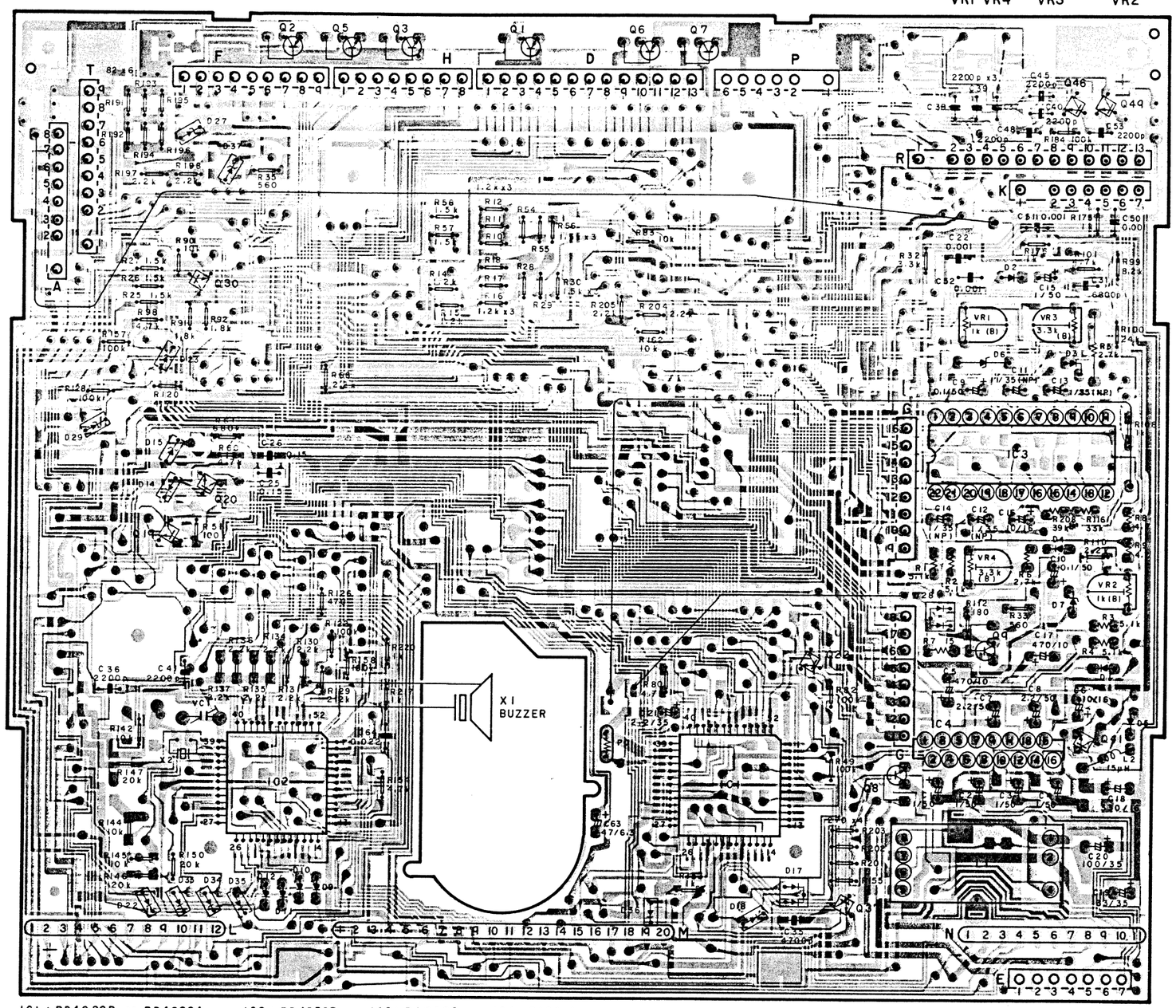
Chip Capacitor

CONTROL UNIT (CWX-529) (FX-K9SDK/WG)



Q10 ~ 15, 17, 18, 21, 23, 25, 31 ~ 36, 38 ~ 40, 42, 45, 47, 48, 50 ~ 54 : 2SC2712 – LG
Q16, 24, 26 ~ 29, 56 : 2SB709 – AQ or 2SA1179 – M5 Q57 : 2SB709 – AQ or 2S
D13, 16 : MA153 D19, 20, 24 : MA151WK D21, 26, 31 : MA3062 D25



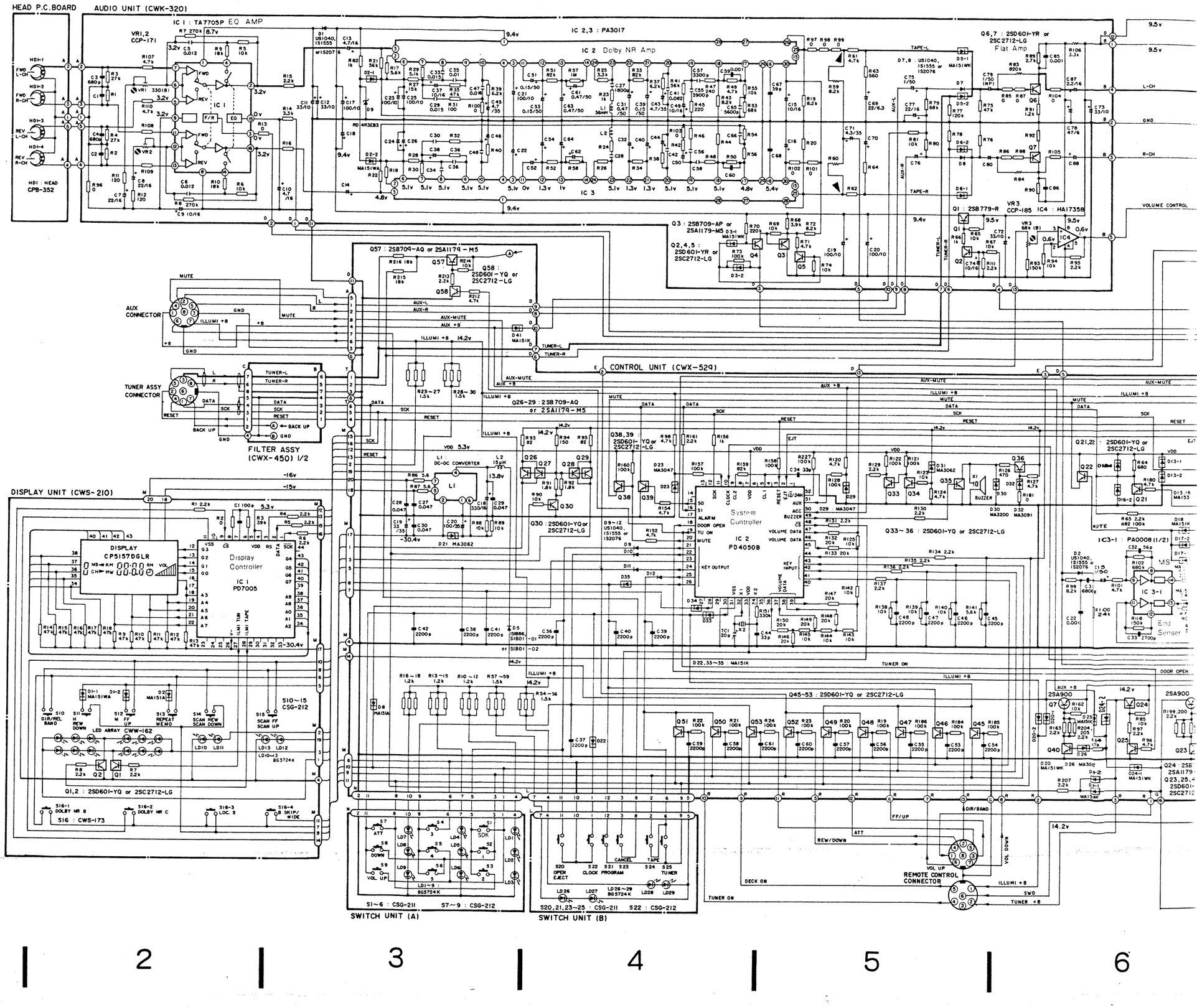


Q58 : 2SC2712-LG or 2SD601-YQ
D8 : MA151A
D25, 38 ~ 42 : MA151K
D30 : MA3200
D32 : MA3091

IC1 : PD4022B or PD4022A
IC2 : PD4050B
IC3 : PA0008
IC4 : PA2014
Q1, 2, 6, 7 : 2SA900
Q3 : 2SD1062
Q5 : 2SC1568
Q8 : 2SB952
Q9 : 2SC2634NC
Q19, 20, 22, 30, 37, 41, 46, 49 : 2SC2712-LG or 2SD601-YQ
D1 ~ 4, 9 ~ 12 : US1040, IS1555 or IS2076
D5 : IS1886, SIB01-01 or SIB01-02
D6, 7 : RD6R8JB3
D14 : MA151A
D15 : MA3043
D17 : MA151WK
D18, 22, 33 ~ 36 : MA151K
D23, 29 : MA3047
D27, 37 : MA3100
D28 : MA151WA

Fig. 47

11. SCHEMATIC CIRCUIT DIAGRAM (FX-K9SDK/WG)



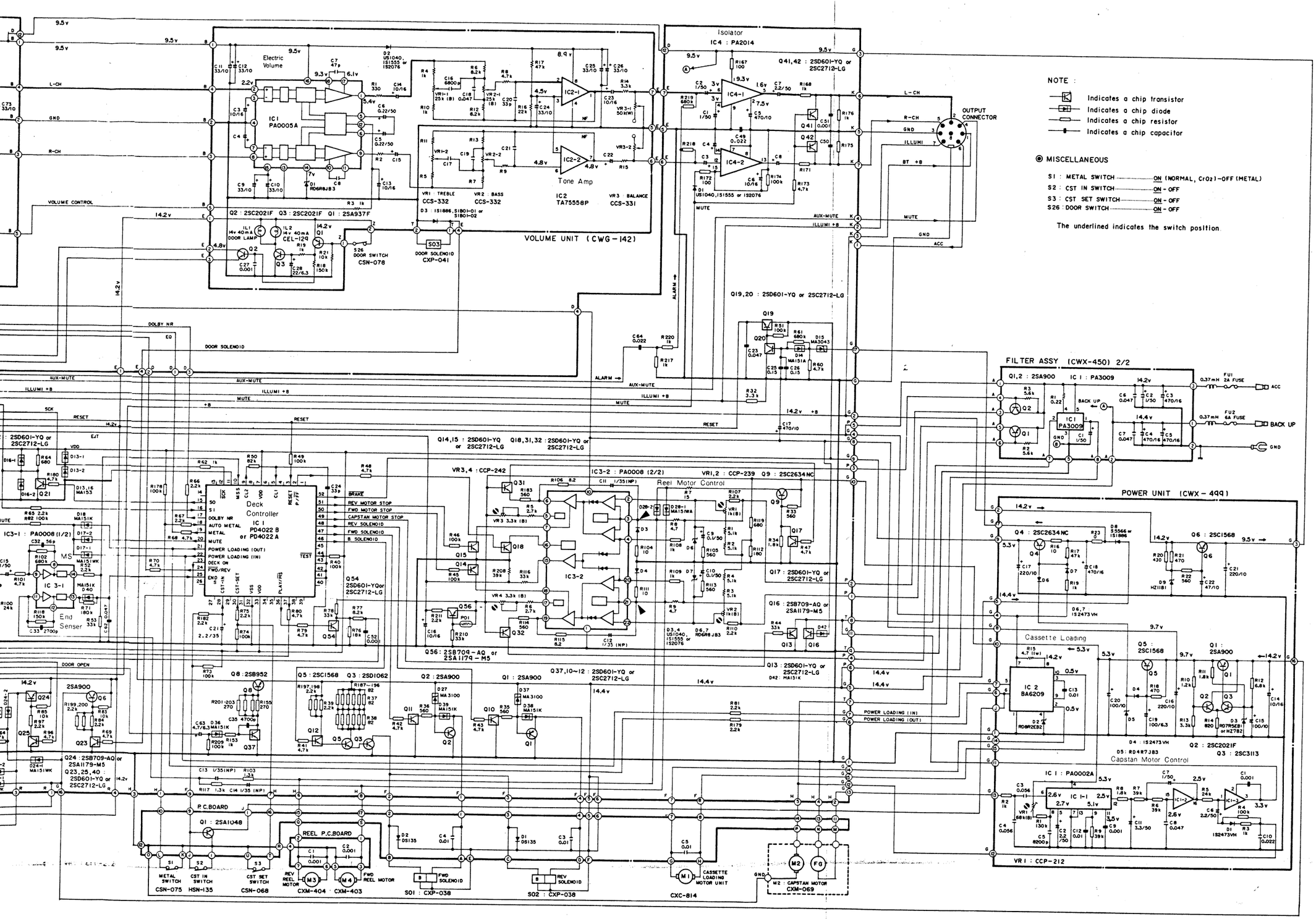
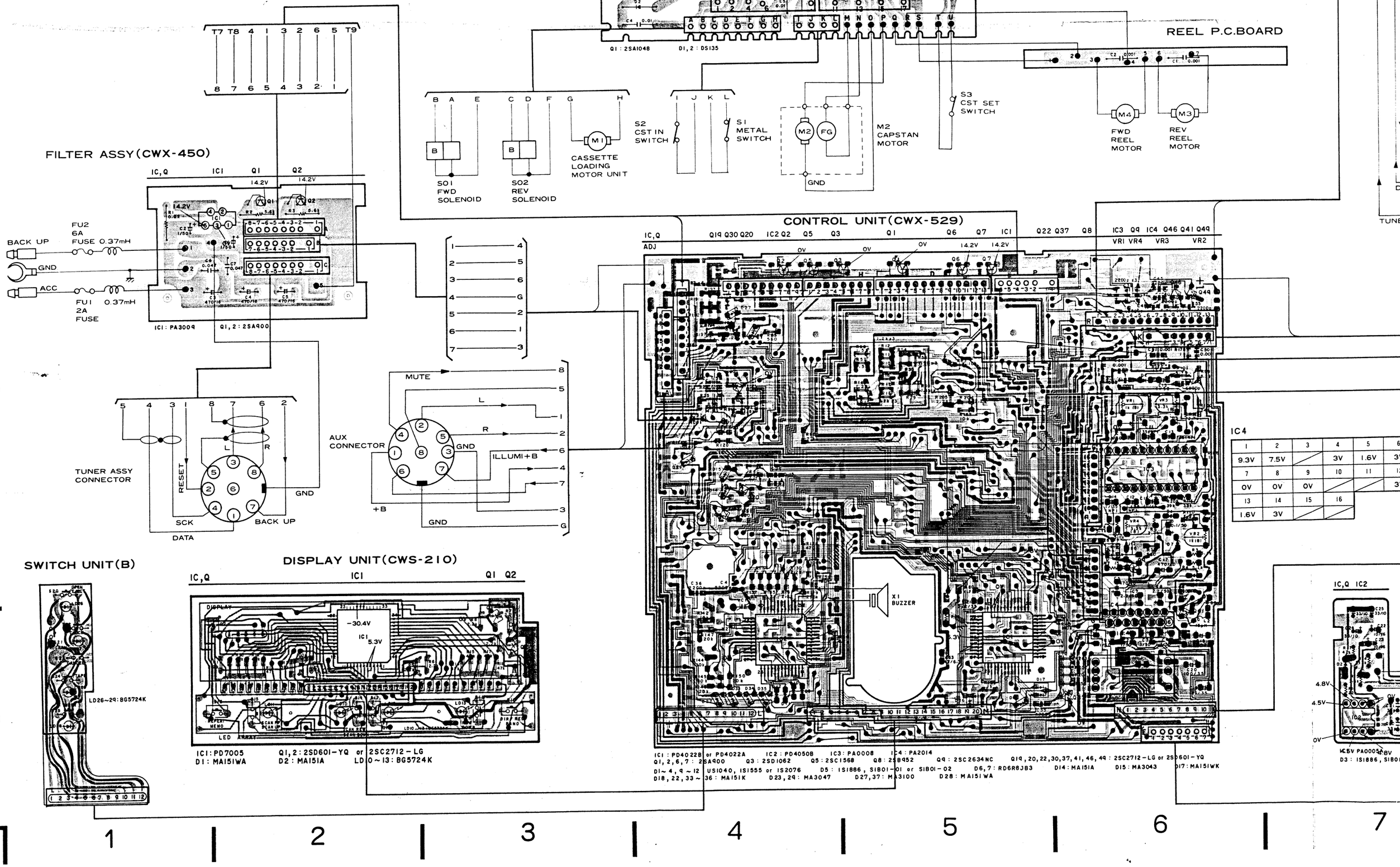
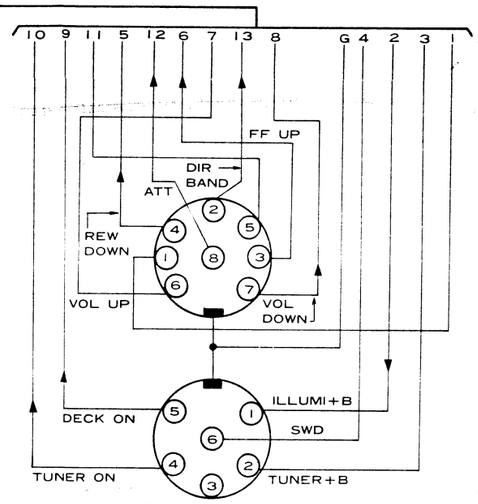

Electric Volume
IC1 PA0005A
VOLUME UNIT (CWG-142)
VRI TREBLE CCS-332
VR2 BASS CCS-332
IC2 TA75558P
VR3 BALANCE CCS-331
Tone Amp
Isolator
IC4 : PA2014
Q41,42 : 2SD601-YQ or 2SC2712-LG
OUTPUT CONNECTOR
L-CH
R-CH
GND
ILLUMI
BT +8
MUTE
AUX-MUTE
ACC
VOLUME CONTROL
DOOR SOLENOID
DOOR OPEN
DOLBY NR
EQ
SCK
RESET
EJT
ALARM
Q19,20 : 2SD601-YQ or 2SC2712-LG
Deck Controller IC1 PD4022 B or PD4022 A
IC3-1 : PA0008 (1/2)
IC3-2 : PA0008 (2/2)
Reel Motor Control
VR3,4 : CCP-242
VR1,2 : CCP-239
Q9 : 2SC2634NC
Q14,15 : 2SD601-YQ or 2SC2712-LG
Q18,31,32 : 2SD601-YQ or 2SC2712-LG
Q54 2SD601-YQor 2SC2712-LG
Q56: 2SB709-AQ or 2SA1179-M5
Q13 : 2SD601-YQ or 2SC2712-LG
Q16 : 2SB709-AQ or 2SA1179-M5
Q17 : 2SD601-YQ or 2SC2712-LG
Q37,10~12 : 2SD601-YQ or 2SC2712-LG
Q24 : 2SB709-AQ or 2SA1179-M5
Q23,25,40 : 2SD601-YQ or 2SC2712-LG
Q8 : 2SB952
Q5 : 2SC1568
Q3 : 2SD1062
Q2 : 2SA900
Q1 : 2SA900
Q1 : 2SA1048
REEL P.C.BOARD
P.C.BOARD
FILTER ASSY (CWX-450) 2/2
Q1,2 : 2SA900
IC 1 : PA3009
FU1 2A FUSE
FU2 6A FUSE
BACK UP
POWER UNIT (CWX-499)
Q4 : 2SC2634NC
Q6 : 2SC1568
Cassette Loading
IC 2 BA6209
Capstan Motor Control
IC 1 : PA0002A
VR1 : CCP-212
S1 METAL SWITCH CSN-075
S2 CST IN SWITCH HSN-135
S3 CST SET SWITCH CSN-068
REV REEL MOTOR
FWD REEL MOTOR
CXM-404 · CXM-403
S01 : CXP-038
FWD SOLENOID
S02 : CXP-038
REV SOLENOID
CASSETTE LOADING MOTOR UNIT
CXC-814
M2 : CAPSTAN MOTOR CXM-069
DOOR SOLENOID CXP-041
DOOR SWITCH CSN-078
Q2 : 2SC2021F Q3 : 2SC2021F Q1 : 2SA937F
D3 : 1S1886,S1B01-01 or S1B01-02
D1 : US1040,1S1555 or 1S2076
D1 : RD6RBJB3
D4 : 1S2473VH
D5 : RD4R7JB3
D1 : 1S2473VH
D1 : HZ11B1
D6,7 : 1S2473VH
D3,4 : US1040,1S1555 or 1S2076
D6,7 : RD6RBJB3
D28-1 : MA151WA
D28-2 : MA151WK
D16-1 : MA151K
D16-2 : Q21
D13-1 : D13-2 : D13,16 MA153
D17-1 : MA151WK
D17-2 : MA151K
D24-1 : D24-2 : D24-4 : MA151WK
D36 : 4.7/6.3 MA151K
D27 : MA3100
D39 : MA151K
D37 : MA3100
D38 : MA151K
D15 : MA3043
D14 : MA151A
D42 : MA151K
D2 : D5135
D1 : D5135
D3 : D5135
D42 : MA151K
D8 : S5566 or 1S1886
D9 : HZ11B1
D3 : RD7R5EB1 or HZ7B2
D2 : RD6R2EB2
NOTE :
Indicates a chip transistor
Indicates a chip diode
Indicates a chip resistor
Indicates a chip capacitor
MISCELLANEOUS
S1 : METAL SWITCH ..... ON (NORMAL, CrO2)-OFF (METAL)
S2 : CST IN SWITCH ..... ON - OFF
S3 : CST SET SWITCH ..... ON - OFF
S26 : DOOR SWITCH ..... ON - OFF
The underlined indicates the switch position.

Fig. 48

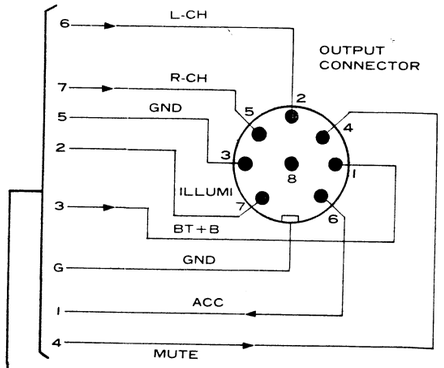
12. CONNECTION DIAGRAM (FX-K9SDK/WG)



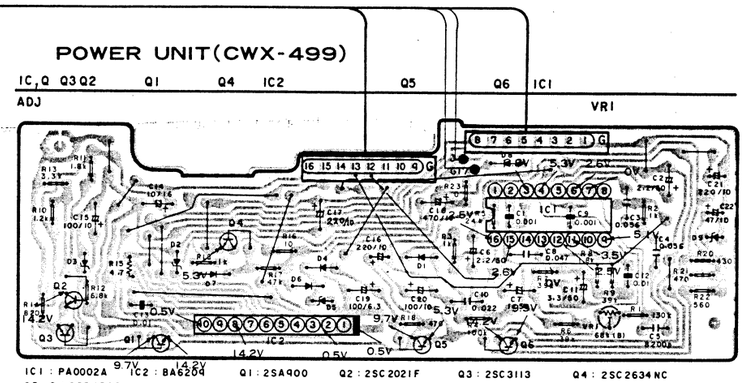


POWER UNIT IC1

1	2	3	4	5	6	7	8	9	10
		3.3V	5.3V		2.6V	0V		5.1V	
11	12	13	14	15	16				
3.5V	2.5V	0V		2.6V	2.5V				



POWER UNIT(CWX-499)

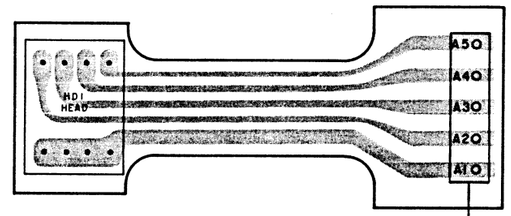


IC1 : PA0002A IC2 : BA6209 Q1 : 2SA900 Q2 : 2SC2021F Q3 : 2SC3113 Q4 : 2SC2634NC
Q5, 6 : 2SC1568
D1, 4, 6, 7 : IS2473VH D2 : RD8R2EB2 D3 : RD7R5EB1 or HZ7B2 D5 : RD4RTJB3 D8 : S5566 or IS1886
D9 : HZ11B1

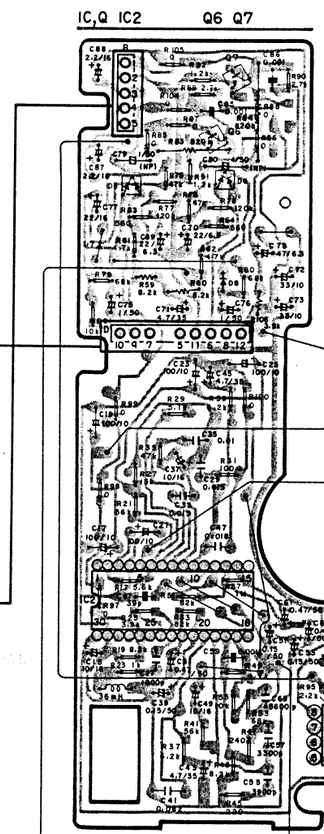
IC4

1	2	3	4	5	6	7	8
0.6V	0.6V		0V	0V			9.5V

HEAD P.C. BOARD



AUDIO UNIT(CWK-320)



IC1

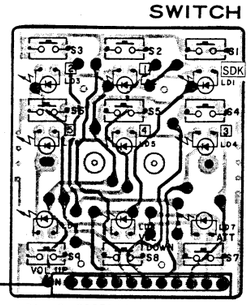
1	2	3	4	5	6	7	8	9	10
8.7V	3.2V	0V		3.2V	3.2V		0V	3.2V	
11	12	13	14	15	16				
				0V	3.2V				

IC2, IC3

1	2	3	4	5	6	7	8	9	10
9.4V		5.1V	0V	4.8V	5.1V	5.1V	5.1V	5.1V	5.1V
11	12	13	14	15	16	17	18	19	20
0V	1.3V	1V			5.4V	4.8V	5.1V	5.1V	5.1V
21	22	23	24	25	26	27	28	29	30
1.3V	1.3V	5.1V						0V	

SWITCH UNIT(A)

4	5	6
3V	1.6V	3V
10	11	12
		3V
16		

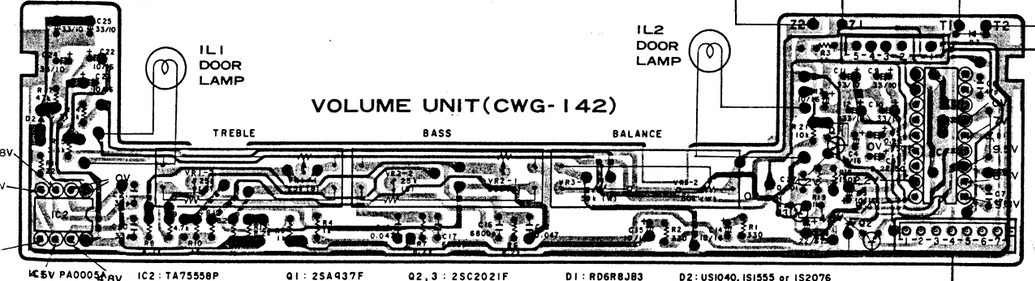


LD1 ~ 9 : BG5724K

S 26
DOOR
SWITCH

DOOR
SOLENOID
SO3

IC,Q IC2



VOLUME UNIT(CWG-142)

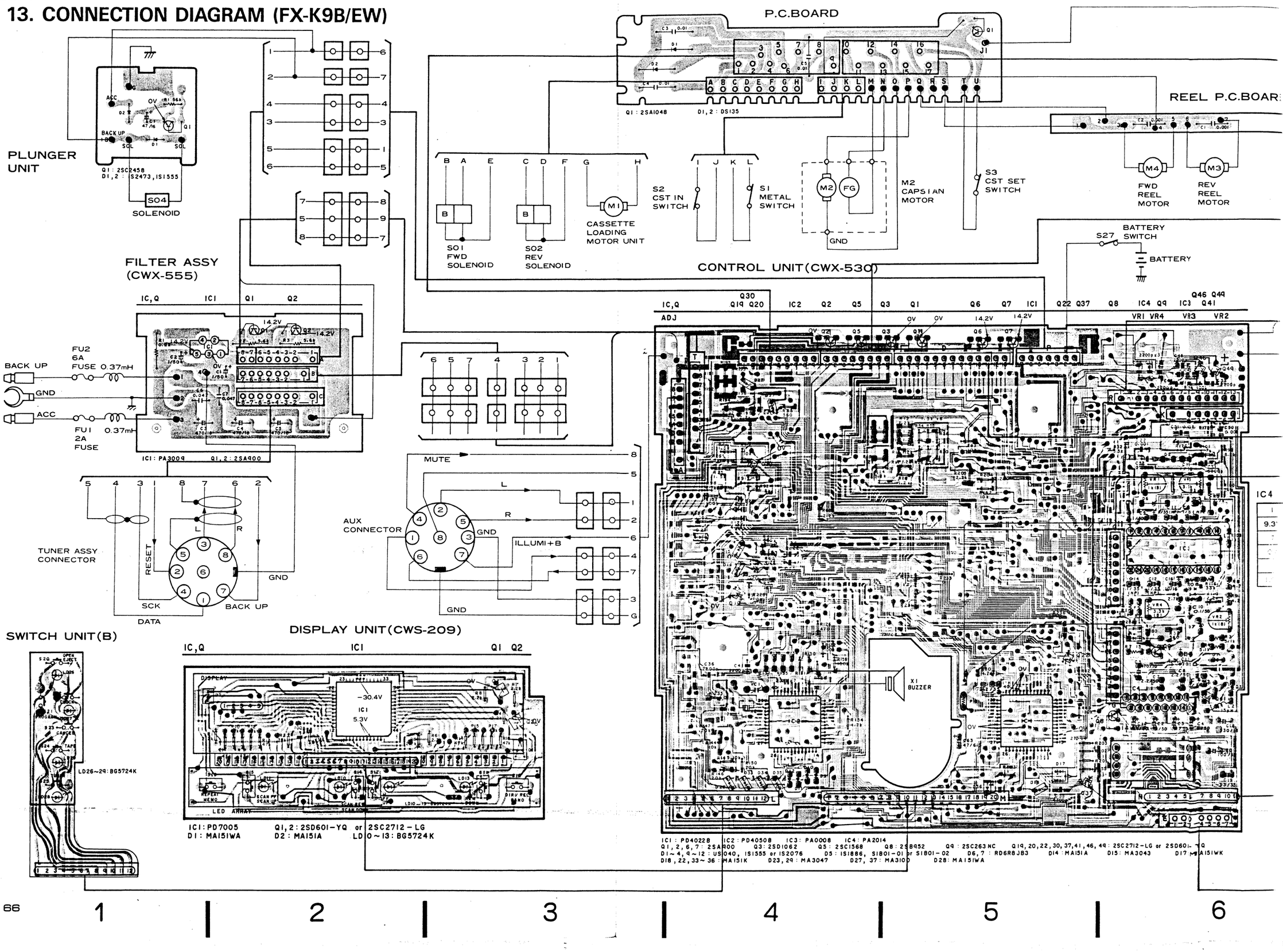
IC : PA0005A IC2 : TA7555BP Q1 : 2SA937F Q2, 3 : 2SC2021F D1 : RD6R8JB3 D2 : US1040, IS1555 or IS2076
D3 : IS1886, SIB01-01 or SIB01-02

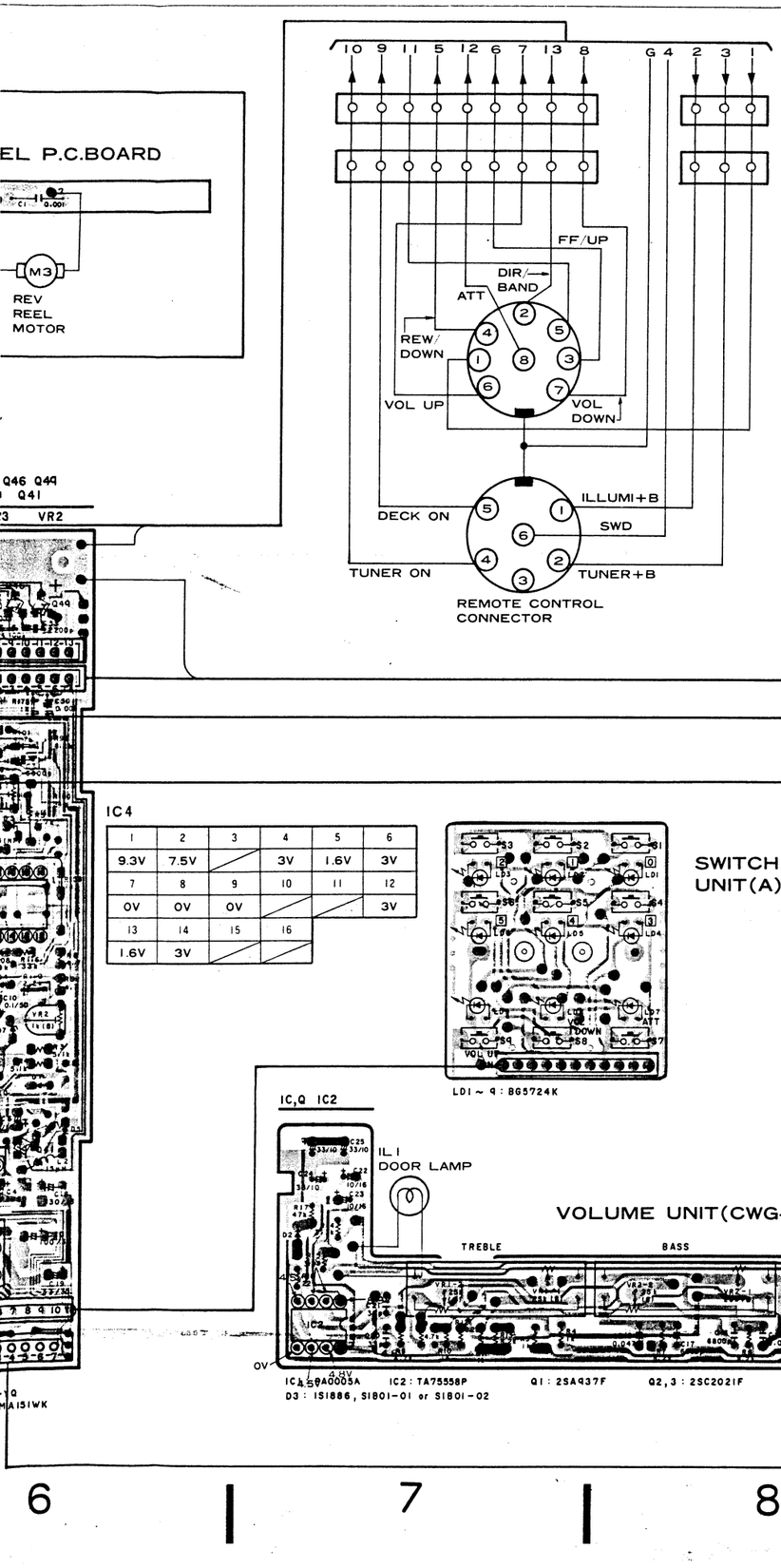
IC4 Q2 Q4
IC,Q Q1 Q3 Q5 IC3 IC1
ADJ VR3 VR2 VR1

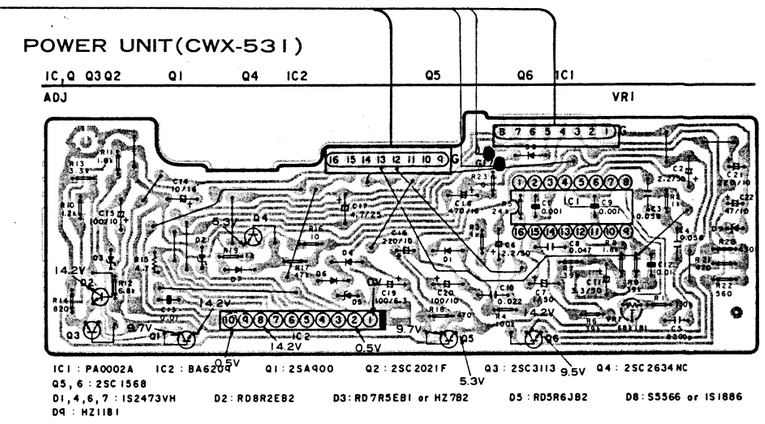
IC1 : TA7705P IC2, 3 : PA3017 IC4 : HA17358 Q1 : 2SB779-R Q2, 4~7 : 2SD601-YR or 2SC2712-LG
Q3 : 2SB709-AP or 2SA1179-M5
D1, 7, 8 : US1040, IS1555 or IS2076 D2 : MA151WA D3, 5, 6 : MA151WK D9 : RD4R3EB3

Fig.49

13. CONNECTION DIAGRAM (FX-K9B/EW)

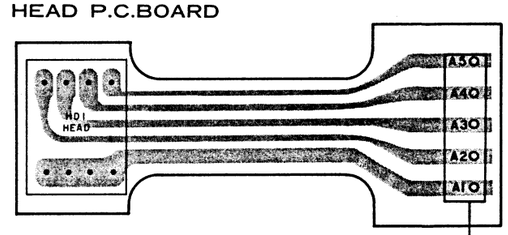


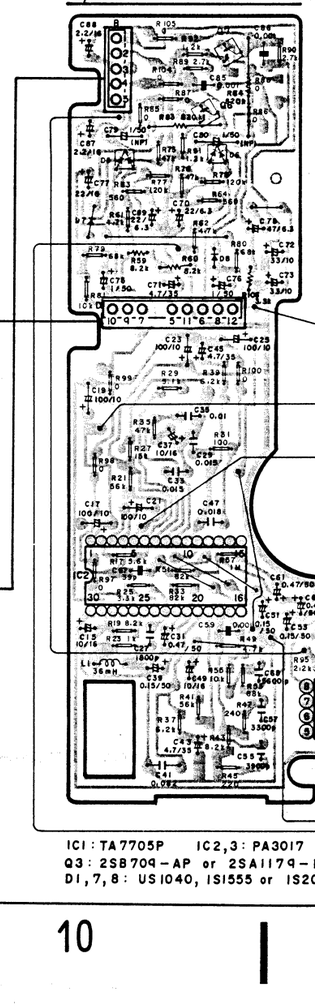



POWER UNIT(CWX-531)
IC,Q Q3 Q2 Q1 Q4 IC2 Q5 Q6 IC1
ADJ
VR1
14.2V
9.7V
0.5V
5.3V
9.5V
IC1 : PA0002A IC2 : BA6209
Q1 : 2SA900 Q2 : 2SC2021F Q3 : 2SC3113 Q4 : 2SC2634NC
Q5, 6 : 2SC1568
D1,4,6,7 : IS2473VH D2 : RD8R2EB2 D3 : RD7R5EB1 or HZ7B2 D5 : RD5R6JB2 D8 : S5366 or IS1886
D9 : HZ11B1

IC4

1	2	3	4	5	6	7	8
0.6V	0.6V		0V	0V			9.5V



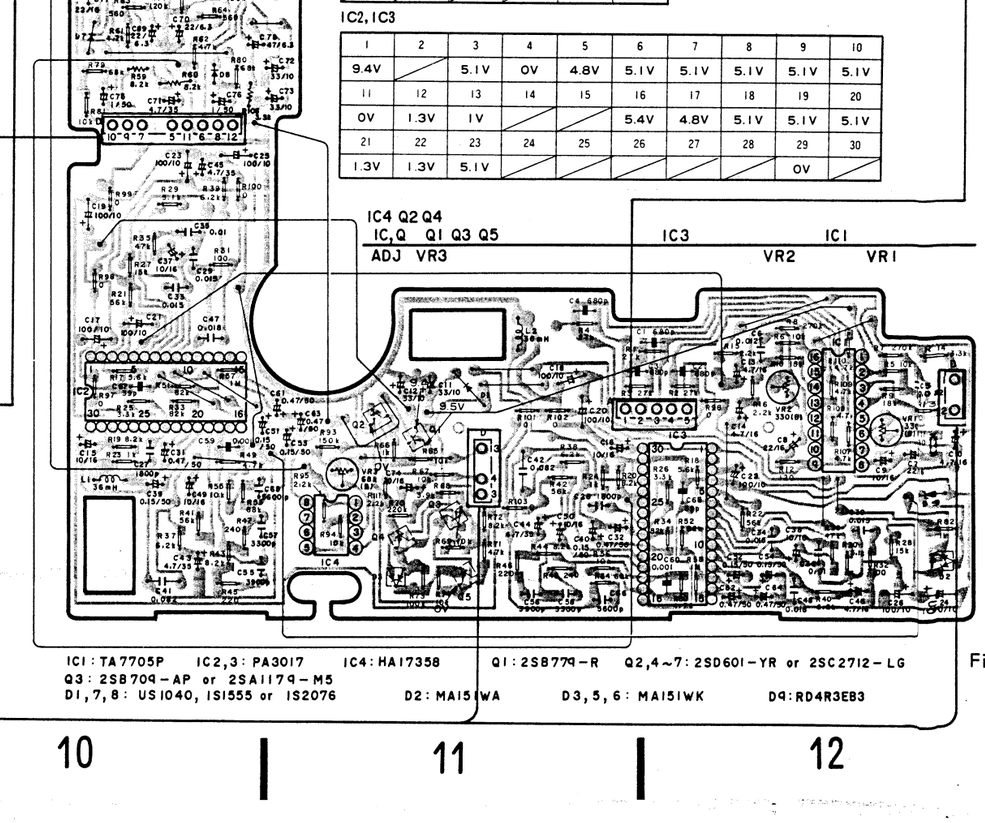


IC1

1	2	3	4	5	6	7	8	9	10
8.7V	3.2V	0V		3.2V	3.2V		0V	3.2V	
11	12	13	14	15	16				
				0V	3.2V				

IC2, IC3

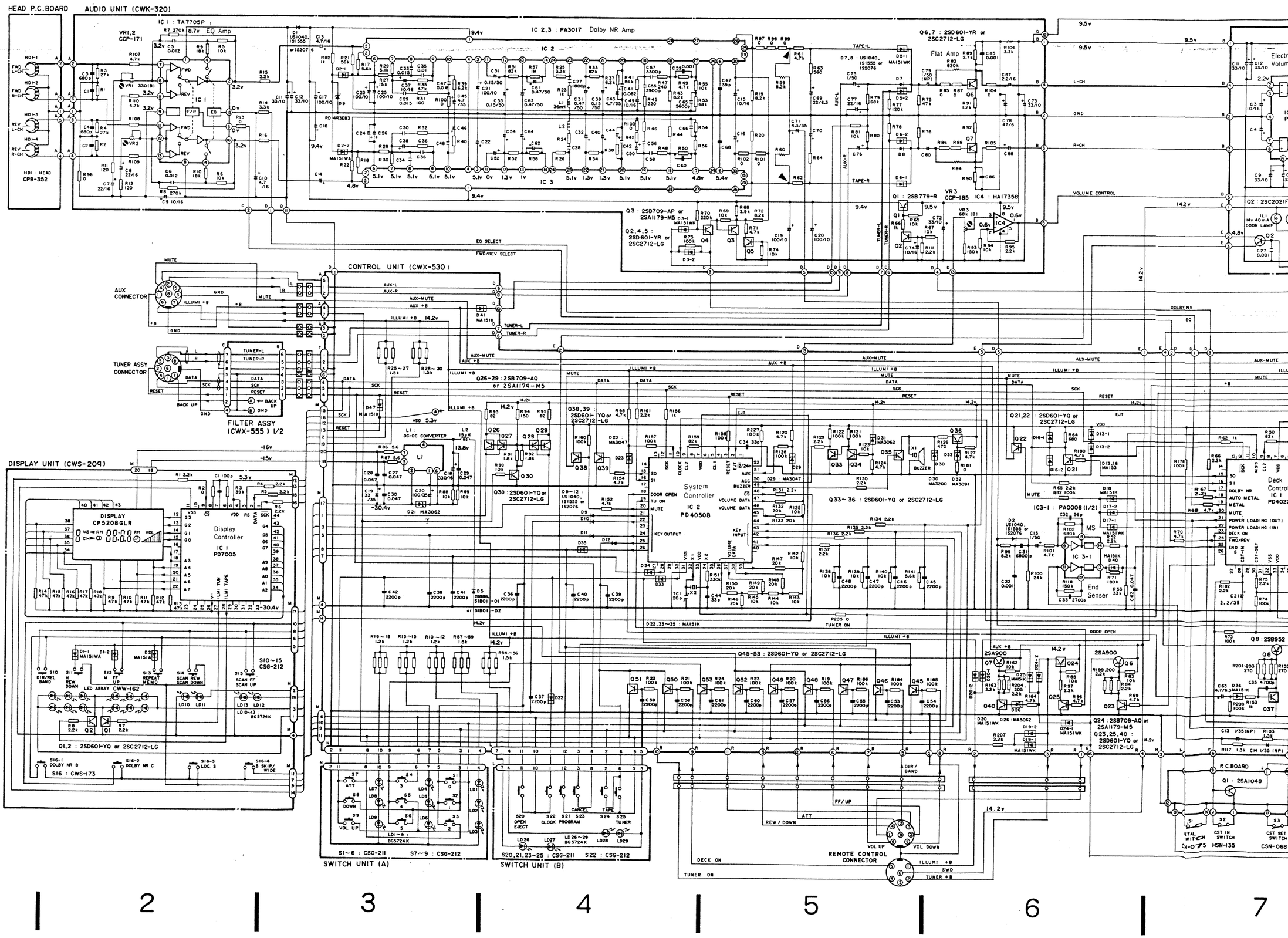
1	2	3	4	5	6	7	8	9	10
9.4V		5.1V	0V	4.8V	5.1V	5.1V	5.1V	5.1V	5.1V
11	12	13	14	15	16	17	18	19	20
0V	1.3V	1V			5.4V	4.8V	5.1V	5.1V	5.1V
21	22	23	24	25	26	27	28	29	30
1.3V	1.3V	5.1V						0V	



IC1 : TA7705P IC2,3 : PA3017 IC4 : HA17358 Q1 : 2SB779-R Q2,4~7 : 2SD601-YR or 2SC2712-LG
Q3 : 2SB709-AP or 2SA1179-M5
D1,7,8 : US1040, IS1555 or IS2076 D2 : MA151WA D3,5,6 : MA151WK D9 : RD4R3EB3

Fig.50

14. SCHEMATIC CIRCUIT DIAGRAM (FX-K9B/EW)



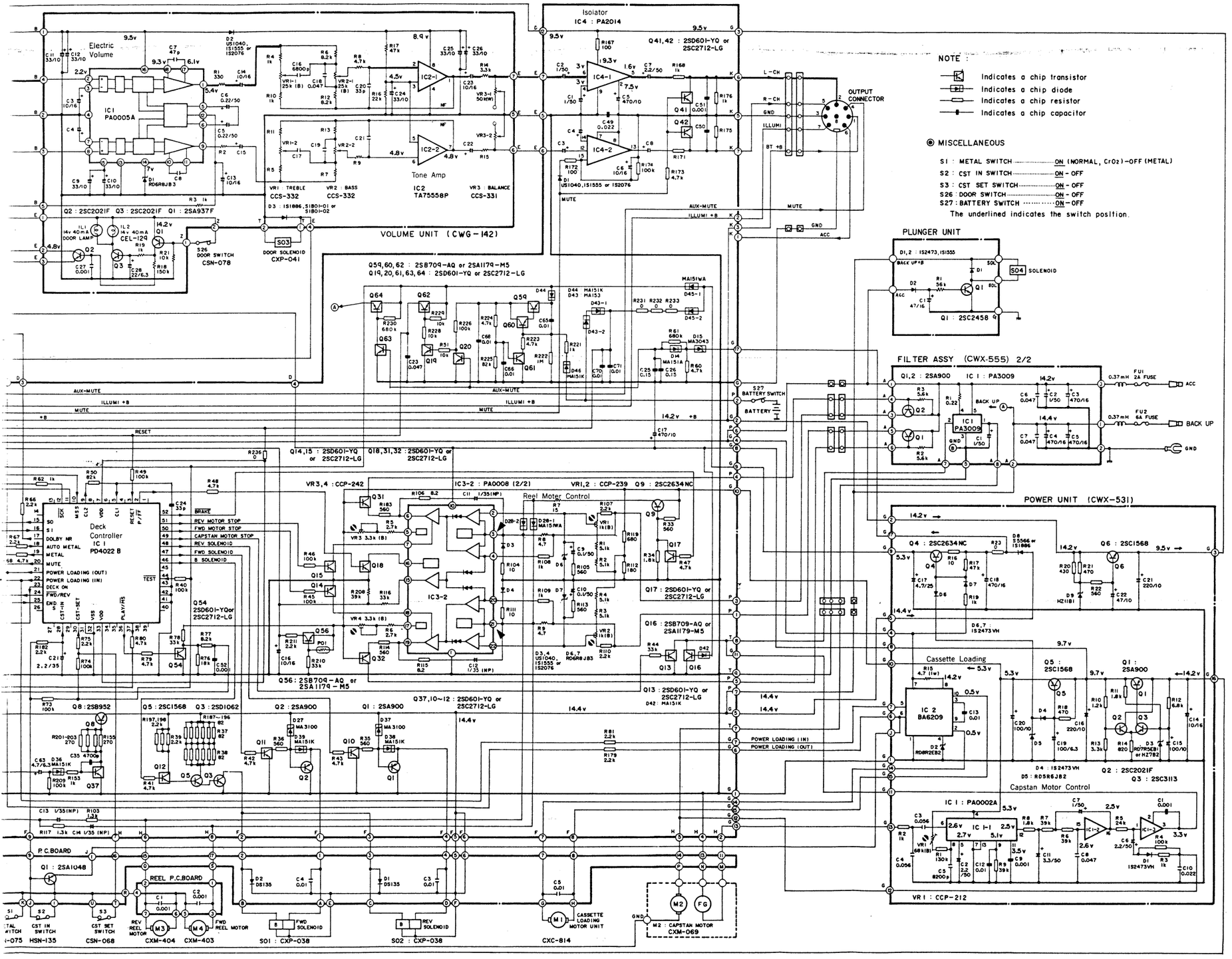
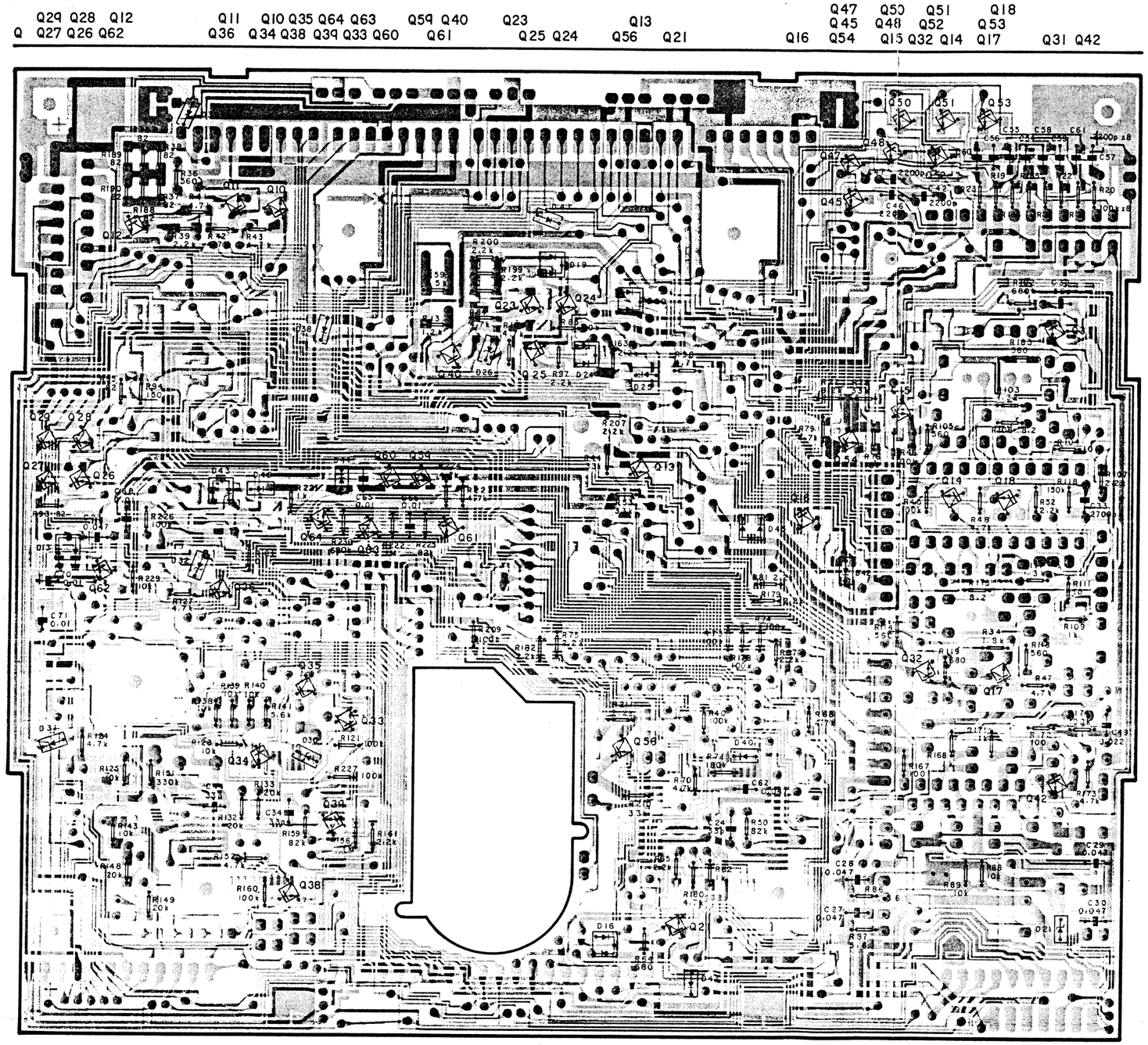
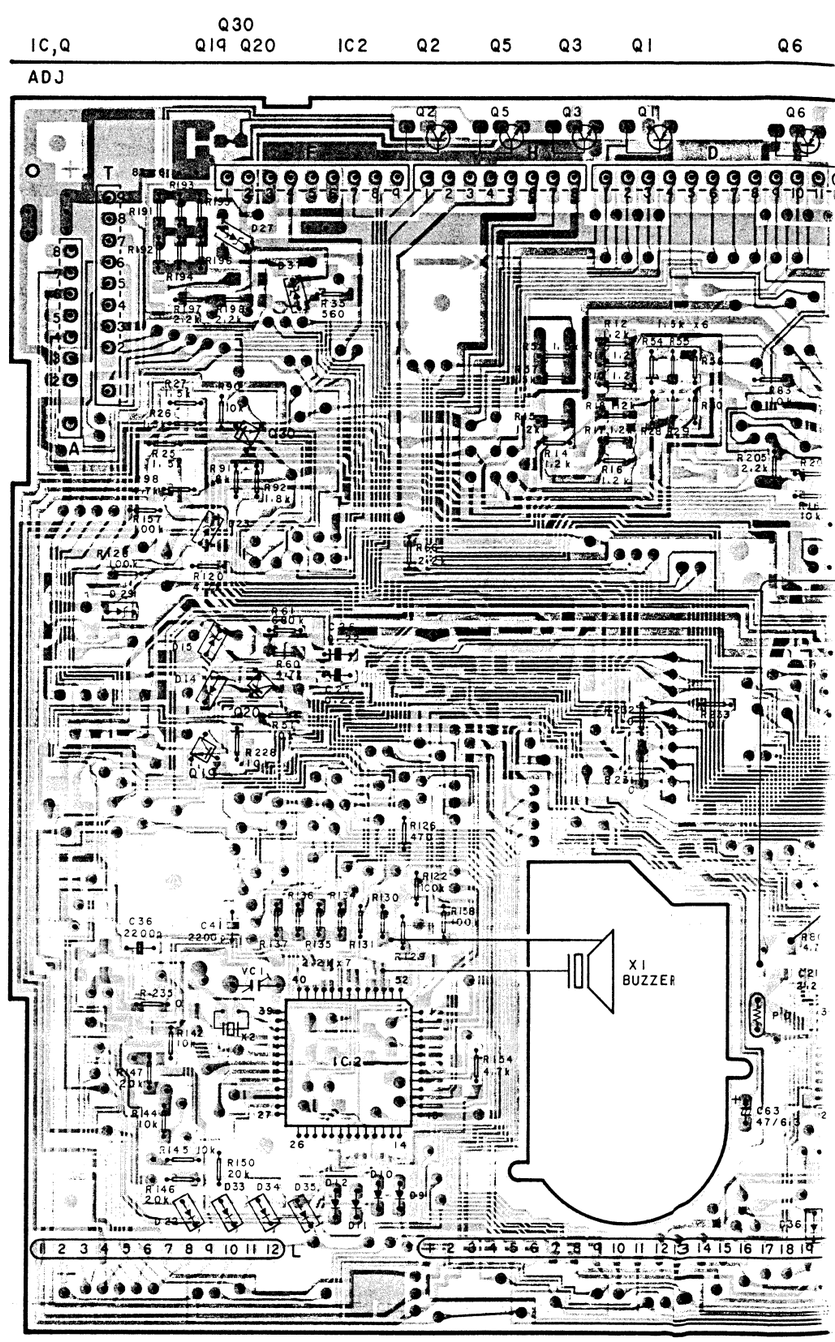

Isolator
IC4 : PA2014
Q41,42 : 2SD601-YQ or 2SC2712-LG
Electric Volume
IC1 PA0005A
VOLUME UNIT (CWG-142)
VR1 : TREBLE CCS-332
VR2 : BASS CCS-332
VR3 : BALANCE CCS-331
IC2 TA75558P
Tone Amp
Q2 : 2SC2021F Q3 : 2SC2021F Q1 : 2SA937F
DOOR SOLENOID CXP-041
DOOR SWITCH CSN-078
OUTPUT CONNECTOR
L-CH
R-CH
GND
ILLUMI
BT +B
MUTE
AUX-MUTE
ILLUMI +B
ACC
NOTE :
Indicates a chip transistor
Indicates a chip diode
Indicates a chip resistor
Indicates a chip capacitor
MISCELLANEOUS
S1 : METAL SWITCH ..... ON (NORMAL, CrO2) - OFF (METAL)
S2 : CST IN SWITCH ..... ON - OFF
S3 : CST SET SWITCH ..... ON - OFF
S26 : DOOR SWITCH ..... ON - OFF
S27 : BATTERY SWITCH ..... ON - OFF
The underlined indicates the switch position.
PLUNGER UNIT
SOLENOID
FILTER ASSY (CWX-555) 2/2
Q1,2 : 2SA900 IC 1 : PA3009
BACK UP
POWER UNIT (CWX-531)
Cassette Loading
IC 2 BA6209
Capstan Motor Control
IC 1 : PA0002A
VR1 : CCP-212
Deck Controller IC 1 PD4022 B
REEL P.C.BOARD
P.C.BOARD
REV REEL MOTOR
FWD REEL MOTOR
CXM-404
CXM-403
FWD SOLENOID
REV SOLENOID
SO1 : CXP-038
SO2 : CXP-038
CASSETTE LOADING MOTOR UNIT
CXC-814
M2 : CAPSTAN MOTOR CXM-069
S1 CST IN SWITCH
S2 CST SET SWITCH
S3 HSN-135
CSN-068
VR3,4 : CCP-242
IC3-2 : PA0008 (2/2)
VR1,2 : CCP-239
Q9 : 2SC2634NC
Reel Motor Control
IC3-2
Q54 2SD601-YQor 2SC2712-LG
Q56 : 2SB709-AQ or 2SA1179-M5
Q13 : 2SD601-YQ or 2SC2712-LG
Q16 : 2SB709-AQ or 2SA1179-M5
Q37,10~12 : 2SD601-YQ or 2SC2712-LG
Q8 : 2SB952
Q5 : 2SC1568 Q3 : 2SD1062
Q2 : 2SA900
Q1 : 2SA900
Q1 : 2SA1048
POWER LOADING (IN)
POWER LOADING (OUT)
Q59,60,62 : 2SB709-AQ or 2SA1179-M5
Q19,20,61,63,64 : 2SD601-YQ or 2SC2712-LG
Q14,15 : 2SD601-YQ or 2SC2712-LG
Q18,31,32 : 2SD601-YQ or 2SC2712-LG
Q4 : 2SC2634NC
Q6 : 2SC1568
Q5 : 2SC1568
Q1 : 2SA900
Q2 : 2SC2021F
Q3 : 2SC3113
14.2v +B
14.4v

Fig. 51

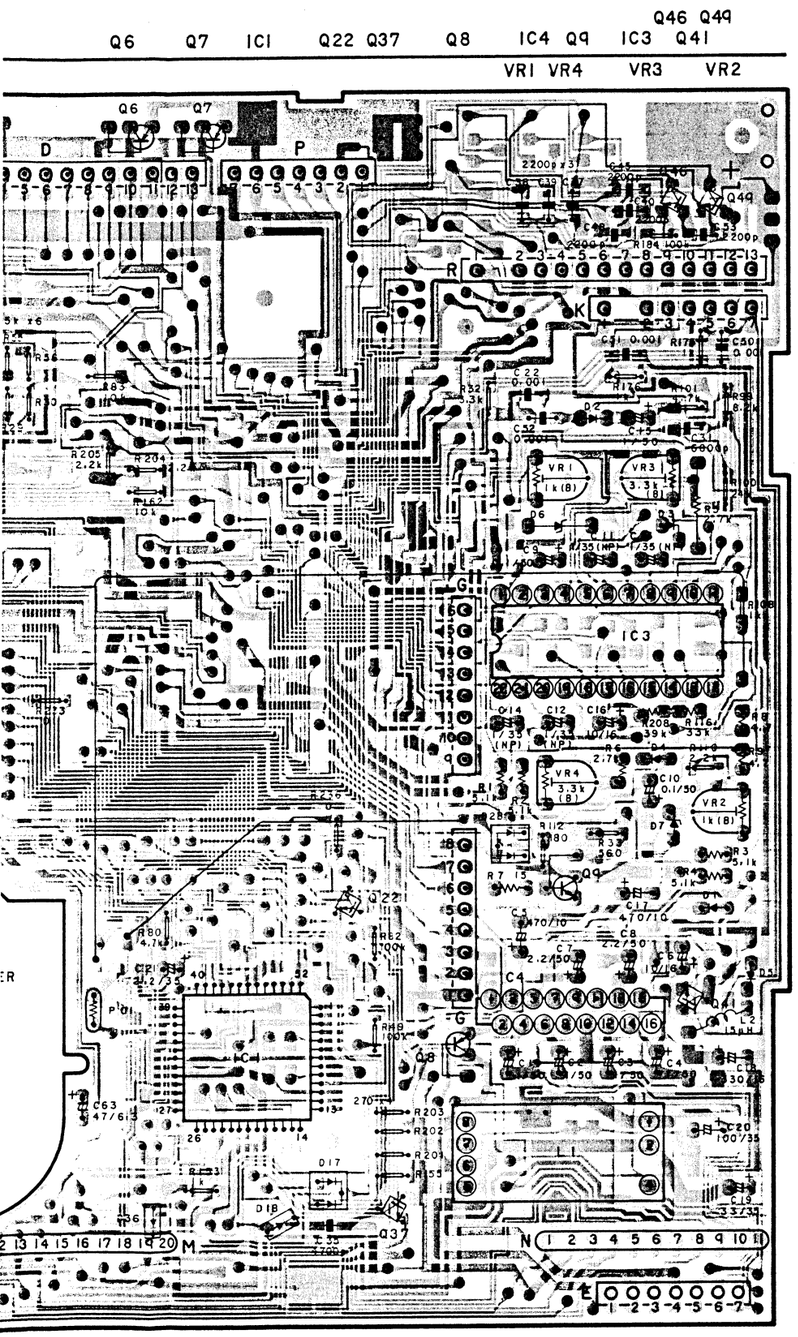
CONTROL UNIT (CWX-530) (FX-K9B/EW)



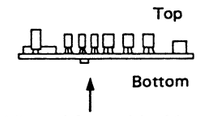
Q10 ~ 15, 17, 18, 21, 23, 25, 31 ~ 36, 38 ~ 40, 42, 45, 47, 48, 50 ~ 54, 61, 63, 64 : 2SC2712 – LG or 2SD601 – YQ
Q16, 24, 26 ~ 29, 56, 59, 60, 62 : 2SB709 – AQ or 2SA1179 – M5
D13, 16, 43 : MA153 D19, 20, 24 : MA151WK D21, 26, 31 : MA3062 D25, 38 ~ 42, 44, 46, 47 : MA151K D30 : MA3200 D32 : MA3091 D45 : MA151WA



IC1 : PD4022B IC2 : PD4050B IC3 : PA0008 IC4 : PA2014
Q1, 2, 6, 7 : 2SA900 Q3 : 2SD1062 Q5 : 2SC1568 Q8 : 2SB952 Q9 : 2SC263
D1 ~ 4, 9 ~ 12 : US1040, IS1555 or IS2076 D5 : IS1886, SIB01 – 01 or SIB01 – 02 D6, 7 :
D18, 22, 33 ~ 36 : MA151K D23, 29 : MA3047 D27, 37 : MA3100 D28 : MA151WA



- Parts mounted onto the control unit are listed separately in the following manner.
  Page 74: Chip parts installed on the bottom of the P.C board.
  Page 76: Parts other than the chip parts installed on the bottom.



Viewed from this side.

ELECTRICAL PARTS LIST (FX-K9B/EW)

Control Unit (CWX-530) (FX-K9B/EW)

MISCELLANEOUS

Mark	Symbol & Description	Part No.
★★	IC1	PD4022B
★★	IC2	PD4050B
★★	IC3	PA0008
★★	IC4	PA2014
★★	Q1, Q2, Q6, Q7	2SA900
★★	Q3	2SD1062
★★	Q5	2SC1568
★★	Q8	2SB952
★★	Q9	2SC2634NC
★★	Q10 – Q15, Q17 – Q23, Q25, Q30 – Q42, Q45 – Q54, Q61, Q63, Q64 Chip Transistor	2SC2712-LG or 2SC2712-LL or 2SC2712-LY or 2SD601-YQ or 2SD601-YR or 2SD601-YS
★★	Q16, Q24, Q26 – Q29, Q56, Q59, Q60, Q62 Chip Transistor	2SB709-AQ or 2SB709-AR or 2SB709-AS or 2SA1179-M5 or 2SA1179-M6 or 2SA1179-M7
★	D1 – D4, D9 – D12	US1040 or 1S1555 or 1S2076
★	D5	1S1886 or SIB01-01 or SIB01-02
★	D6, D7	RD6R8JB3
★	D13, D16, D43 Chip Diode	MA153
★	D14 Chip Diode	MA151A
★	D15 Chip Diode	MA3043
★	D17, D19, D20, D24 Chip Diode	MA151WK
★	D18, D22, D25, D33 – D36, D38 – D42, D44, D46, D47 Chip Diode	MA151K
★	D21, D26, D31 Chip Diode	MA3062
★	D23, D29 Chip Diode	MA3047
★	D27, D37 Chip Diode	MA3100
★	D28, D45 Chip Diode	MA151WA
★	D30 Chip Diode	MA3200
★	D32 Chip Diode	MA3091
	L1 Transformer	CTX-073
	L2 Ferri-Inductor	CTF-078
	PO1 Posistor	CCX-010
	VC1 Trimmer	CCG-070
★★	VR1, VR2 Semi-fixed, 1kΩ (B)	CCP-239
★★	VR3, VR4 Semi-fixed, 3.3kΩ (B)	CCP-242
	X1 Buzzer	CPV-031
	X2 X'tal	CSS-029

RESISTORS

Mark	Symbol & Description	Part No.
	R1 – R4 5.1kΩ	CCN-099
	R5, R6 2.7kΩ	CCN-110
	R7, R116, R208	RD1/4VM □□□J
	R8, R9	RD1/4PM □□□J
	Other Resistors (Chip Resistor)	RS1/8S □□□J

CAPACITORS

Mark	Symbol & Description	Part No.
	C1 – C4, C15	CEA010M50L2
	C5, C17	CEA471M10L2
	C6, C16	CEA100M16L2
	C7, C8	CEA2R2M50L2
	C9, C10	CEA0R1M50L2
	C11 – C14	CEA010M35NP
	C18	CEA331M16L2
	C19	CEA330M35LL
	C20	CEA101M35L2
	C21	CEA2R2M35LS
	C22, C52 Chip Capacitor	CKSYB102K50
	C23, C27 – C30 Chip Capacitor	CKSYF473Z50
	C24, C34, C44 Chip Capacitor	CCSCH330J50
	C25, C26 Chip Capacitor	CKSYF224Z25
	C31 Chip Capacitor	CKSYB682K50
	C32 Chip Capacitor	CCSCH560J50
	C33 Chip Capacitor	CKSYB272K50
	C35 Chip Capacitor	CKSYB472K50
	C36 – C42, C45 – C48, C53 – C61 Chip Capacitor	CKSYB222K50
	C49 Chip Capacitor	CKSYB223K50
	C50, C51 Chip Capacitor	CCSSL102J50
	C62 Chip Capacitor	CKSYB473K25
	C63	CEA470M6R3LS
	C65, C66, C68, C70, C71 Chip Capacitor	CKSYB103K50

ELECTRICAL PARTS LIST (FX-K9/EW)

Control Unit (CWX-528) (FX-K9/EW)

MISCELLANEOUS

Mark	Symbol & Description	Part No.
★★	IC1	PD4022B or PD4022A
★★	IC2	PD4050B
★★	IC3	PA0008
★★	IC4	PA2014
★★	Q1, Q2, Q6, Q7	2SA900
★★	Q3	2SD1062
★★	Q5	2SC1568
★★	Q8	2SB952
★★	Q9	2SC2634NC
★★	Q10 – Q15, Q17 – Q23, Q25, Q30 – Q42, Q45 – Q54 Chip Transistor	2SC2712-LG or 2SC2712-LL or 2SC2712-LY or 2SD601-YQ or 2SD601-YR or 2SD601-YS
★★	Q16, Q24, Q26 – Q29, Q56 Chip Transistor	2SB709-AQ or 2SB709-AR or 2SB709-AS or 2SA1179-M5 or 2SA1179-M6 or 2SA1179-M7
★	D1 – D4, D9 – D12	US1040 or 1S1555 or 1S2076
★	D5	1S1886 or SIB01-01 or SIB01-02
★	D6, D7	RD6R8JB3
★	D14 Chip Diode	MA151A
★	D13, D16 Chip Diode	MA153
★	D15 Chip Diode	MA3043
★	D17, D19, D20, D24 Chip Diode	MA151WK
★	D18, D22, D25, D33 – D36, D38 – D42 Chip Diode	MA151K
★	D21, D26, D31 Chip Diode	MA3062
★	D23, D29 Chip Diode	MA3047
★	D27, D37 Chip Diode	MA3100
★	D28 Chip Diode	MA151WA
★	D30 Chip Diode	MA3200
★	D32 Chip Diode	MA3091
	L1 Transformer	CTX-073
	L2 Ferri-Inductor	CTF-078
	PO1 Posistor	CCX-010
	VC1 Trimmer	CCG-070
★★	VR1, VR2 Semi-fixed, 1kΩ (B)	CCP-239
★★	VR3, VR4 Semi-fixed, 3.3kΩ (B)	CCP-242
	X1 Buzzer	CPV-031
	X2 X'tal	CSS-029

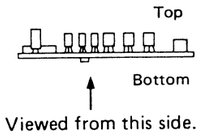
RESISTORS

Mark	Symbol & Description	Part No.
	R1 – R4 5.1kΩ	CCN-099
	R5, R6 2.7kΩ	CCN-110
	R7, R116, R208	RD1/4VM □□□J
	R8, R9	RD1/4PM □□□J
	Other Resistors (Chip Resistor)	RS1/8S □□□J

CAPACITORS

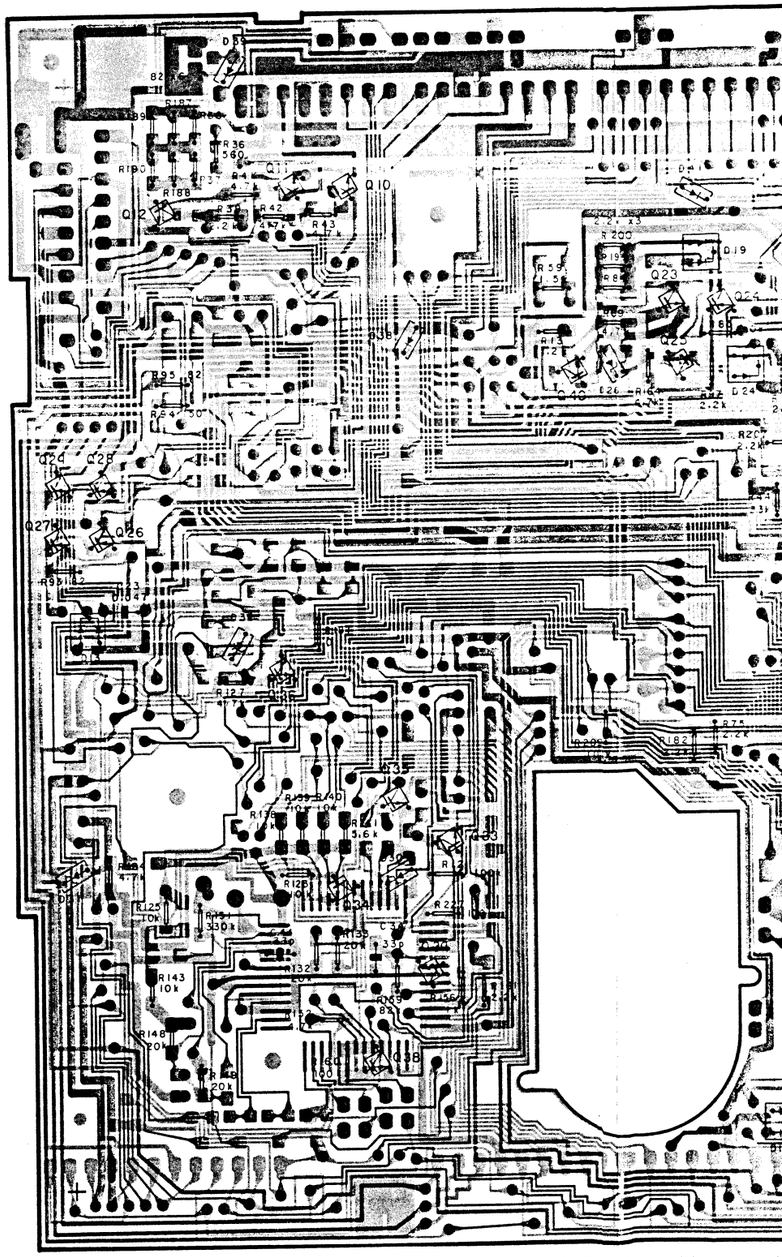
Mark	Symbol & Description	Part No.
	C1 – C4, C15	CEA010M50L2
	C5, C17	CEA471M10L2
	C6, C16	CEA100M16L2
	C7, C8	CEA2R2M50L2
	C9, C10	CEA0R1M50L2
	C11 – C14	CEA010M35NP
	C18	CEA331M16L2
	C19	CEA330M35LL
	C20	CEA101M35L2
	C21	CEA2R2M35LS
	C22, C52 Chip Capacitor	CKSYB102K50
	C23, C27 – C30 Chip Capacitor	CKSYF473Z50
	C24, C34, C44 Chip Capacitor	CCSCH330J50
	C25, C26 Chip Capacitor	CKSYF154Z25
	C31 Chip Capacitor	CKSYB682K50
	C32 Chip Capacitor	CCSCH560J50
	C33 Chip Capacitor	CKSYB272K50
	C35 Chip Capacitor	CKSYB472K50
	C36 – C42, C45 – C48, C53 – C61 Chip Capacitor	CKSYB222K50
	C49 Chip Capacitor	CKSYB223K50
	C50, C51 Chip Capacitor	CCSSL102J50
	C62 Chip Capacitor	CKSYB473K25
	C63	CEA470M6R3LS

- Parts mounted onto the control unit are listed separately in the following manner.
  Page 79: Chip parts installed on the bottom of the P.C board.
  Page 81: Parts other than the chip parts installed on the bottom.

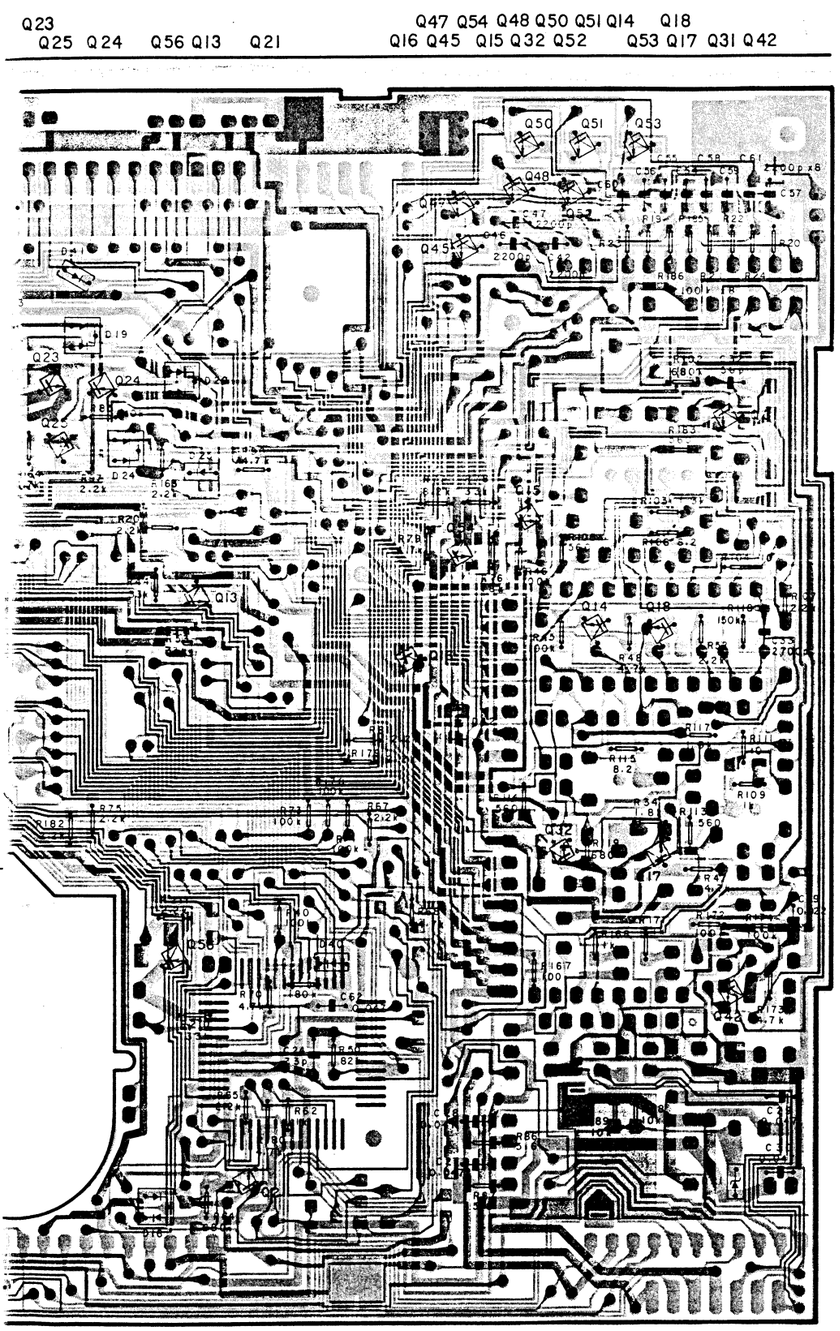


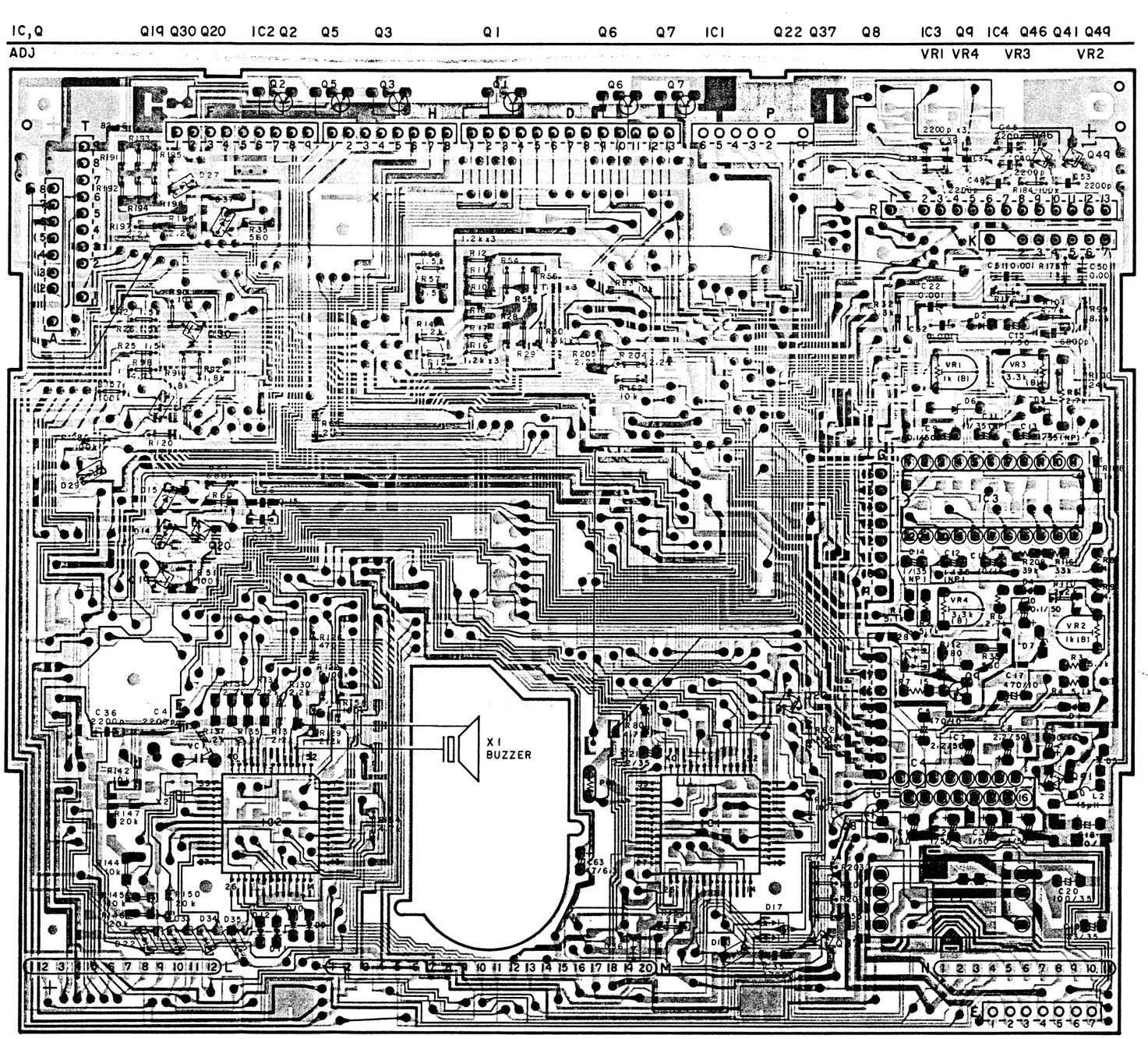
Viewed from this side.

CONTROL UNIT (CWX-528) (FX-K9/EW)



Q10 ~ 15, 17, 18, 21, 23, 25, 31 ~ 36, 38 ~ 40, 42, 45, 47, 48, 50 ~ 54 : 2SC2712 – LG
Q16, 24, 26 ~ 29, 56 : 2SB709 – AQ or 2SA1179 – M5
D13, 16 : MA153 D19, 20, 24 : MA151WK D21, 26, 31 : MA3062 D2





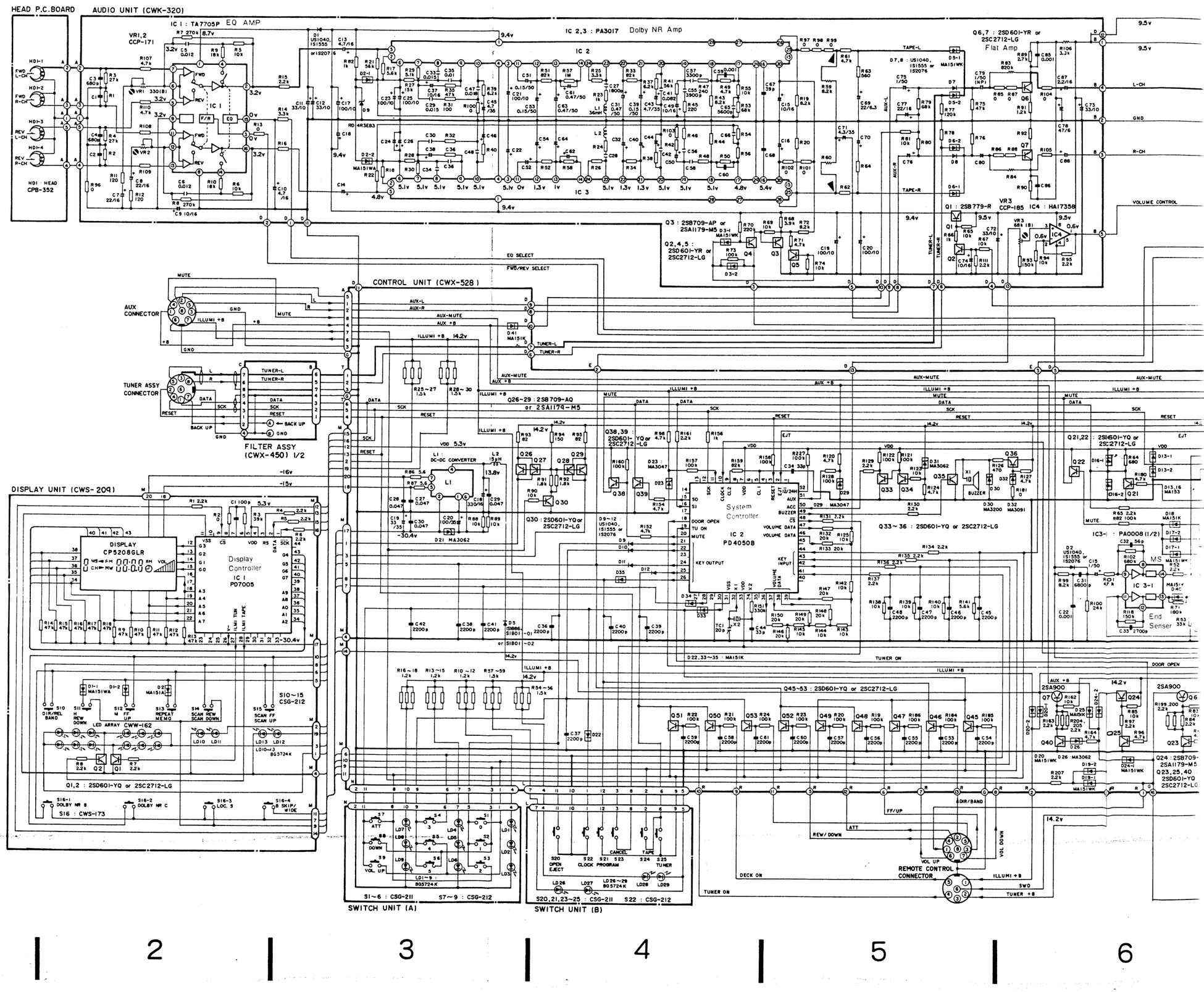
4 : 2SC2712 – LG or 2SD601 – YQ

MA3062 D25, 38 ~ 42 : MA151K D30 : MA3200 D32 : MA3091

IC1 : PD4022B or PD4022A IC2 : PD4050B IC3 : PA0008 IC4 : PA2014
Q1, 2, 6, 7 : 2SA900 Q3 : 2SD1062 Q5 : 2SC1568 Q8 : 2SB952 Q9 : 2SC2634NC Q19, 20, 22, 30, 37, 41, 46, 49 : 2SC2712 – LG or 2SD601 – YQ
D1 ~ 4, 9 ~ 12 : US1040, IS1555 or IS2076 D5 : IS1886, SIB01 – 01 or SIB01 – 02 D6, 7 : RD6R8JB3 D14 : MA151A D15 : MA3043 D17 : MA151WK
D18, 22, 33 ~ 36 : MA151K D23, 29 : MA3047 D27, 37 : MA3100 D28 : MA151WA

Fig. 53

15. SCHEMATIC CIRCUIT DIAGRAM (FX-K9/EW)



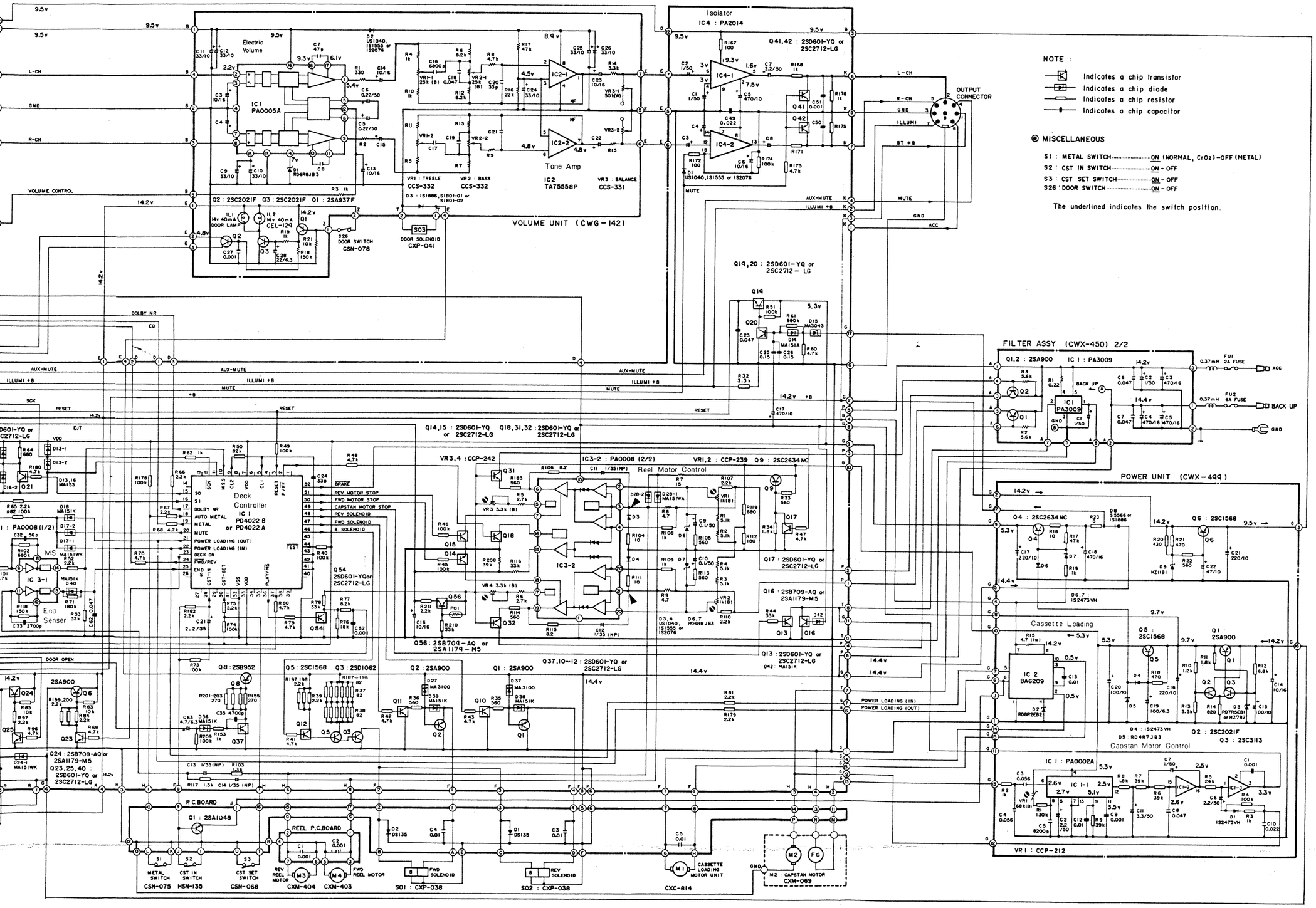
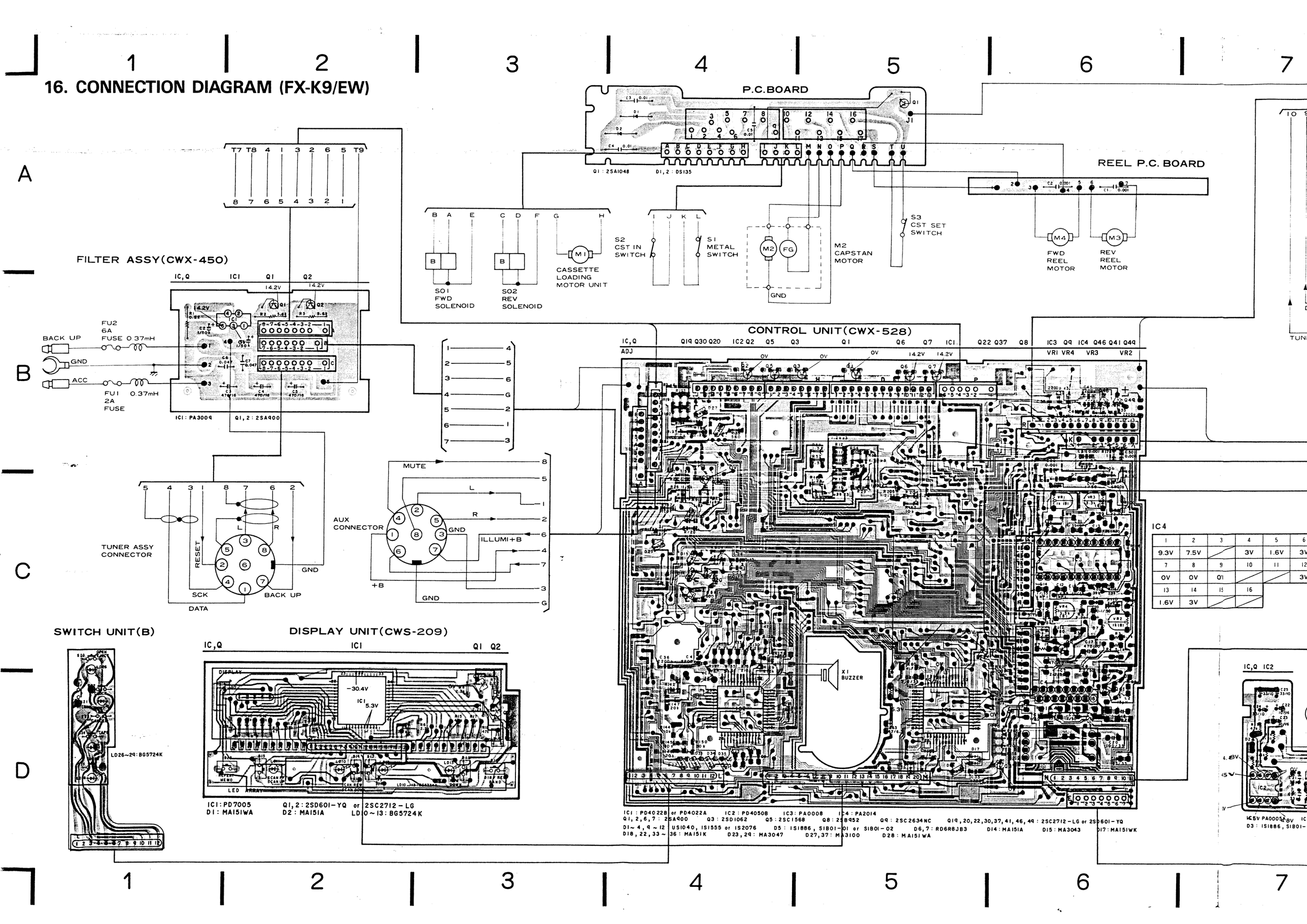
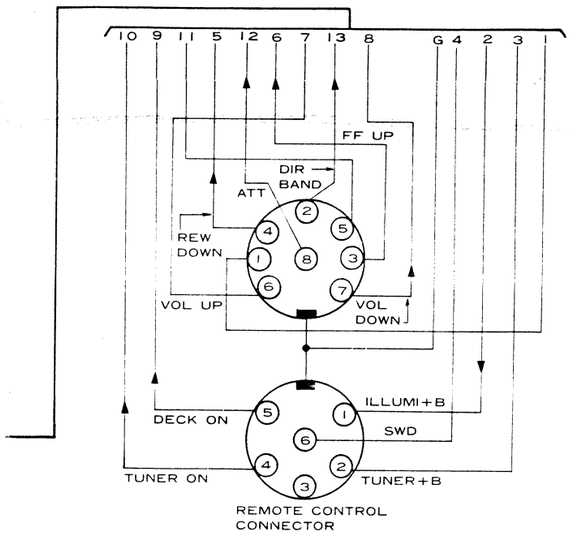

NOTE :
Indicates a chip transistor
Indicates a chip diode
Indicates a chip resistor
Indicates a chip capacitor
MISCELLANEOUS
S1 : METAL SWITCH ..... ON (NORMAL, CrO2) - OFF (METAL)
S2 : CST IN SWITCH ..... ON - OFF
S3 : CST SET SWITCH ..... ON - OFF
S26 : DOOR SWITCH ..... ON - OFF
The underlined indicates the switch position.
VOLUME UNIT (CWG-142)
FILTER ASSY (CWX-450) 2/2
POWER UNIT (CWX-499)
Deck Controller IC 1 PD4022 B or PD4022 A
Tone Amp
Reel Motor Control
Cassette Loading
Capstan Motor Control
OUTPUT CONNECTOR
Isolator IC4 : PA2014
REEL P.C.BOARD
P.C.BOARD
CSN-075
HSN-135
CSN-068
CXM-404
CXM-403
CXP-038
CXP-038
CXC-814
CXM-069

Fig. 54

16. CONNECTION DIAGRAM (FX-K9/EW)

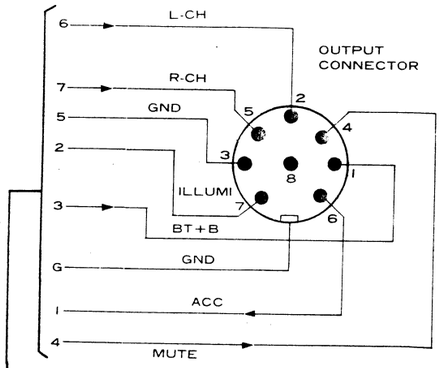

P.C.BOARD
Q1 : 2SA1048
D1, 2 : DS135
REEL P.C. BOARD
FWD REEL MOTOR
REV REEL MOTOR
M2 CAPSTAN MOTOR
S3 CST SET SWITCH
S2 CST IN SWITCH
S1 METAL SWITCH
CASSETTE LOADING MOTOR UNIT
S01 FWD SOLENOID
S02 REV SOLENOID
GND
FILTER ASSY(CWX-450)
BACK UP
GND
ACC
FU2 6A FUSE 0.37mH
FU1 2A FUSE 0.37mH
IC1 : PA3009
Q1, 2 : 2SA900
TUNER ASSY CONNECTOR
RESET
SCK
DATA
BACK UP
AUX CONNECTOR
MUTE
L
R
GND
ILLUMI+B
+B
CONTROL UNIT(CWX-528)
X1 BUZZER
IC1 : PD4022B or PD4022A IC2 : PD4050B IC3 : PA0008 IC4 : PA2014
Q1, 2, 6, 7 : 2SA900 Q3 : 2SD1062 Q5 : 2SC1568 Q8 : 2SB452 Q9 : 2SC2634NC Q19, 20, 22, 30, 37, 41, 46, 49 : 2SC2712-LG or 2SD601-YQ
D1~4, 9~12 : US1040, IS1555 or IS2076 D5 : IS1886, SIB01-01 or SIB01-02 D6, 7 : RD6R8JB3 D14 : MA151A D15 : MA3043 D17 : MA151WK
D18, 22, 33~36 : MA151K D23, 24 : MA3047 D27, 37 : MA3100 D28 : MA151WA
SWITCH UNIT(B)
LD26~29 : BG5724K
DISPLAY UNIT(CWS-209)
IC1 : PD7005 Q1, 2 : 2SD601-YQ or 2SC2712-LG
D1 : MA151WA D2 : MA151A LD0~13 : BG5724K
IC4
IC2
D3 : IS1886, SIB01-

IC4					
1	2	3	4	5	6
9.3V	7.5V		3V	1.6V	3V
7	8	9	10	11	12
0V	0V	0V			3V
13	14	15	16		
1.6V	3V				

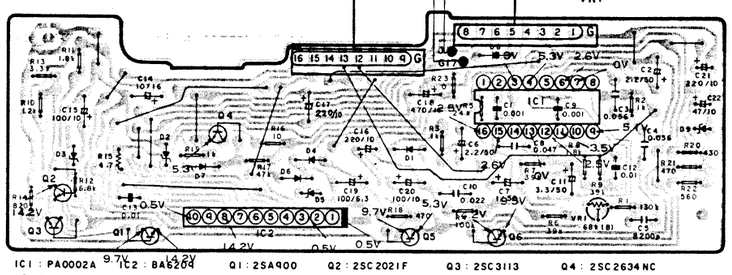


POWER UNIT IC1

1	2	3	4	5	6	7	8	9	10
		3.3V	5.3V		2.6V	0V		5.1V	
11	12	13	14	15	16				
3.5V	2.5V	0V		2.6V	2.5V				



POWER UNIT(CWX-499)

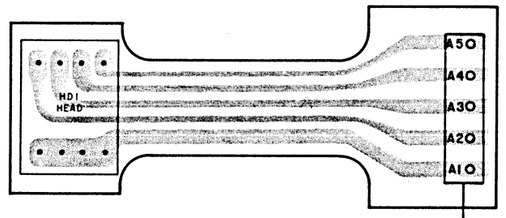


IC1 : PA0002A IC2 : BA6204 Q1 : 2SA900 Q2 : 2SC2021F Q3 : 2SC3113 Q4 : 2SC2634NC
Q5, 6 : 2SC1568
D1, 4, 6, 7 : IS2473VH D2 : RD8R2EB2 D3 : RD7R5EB1 or HZ7B2 D5 : RD4R1JB3 D8 : S5566 or IS1886
D9 : HZ11B1

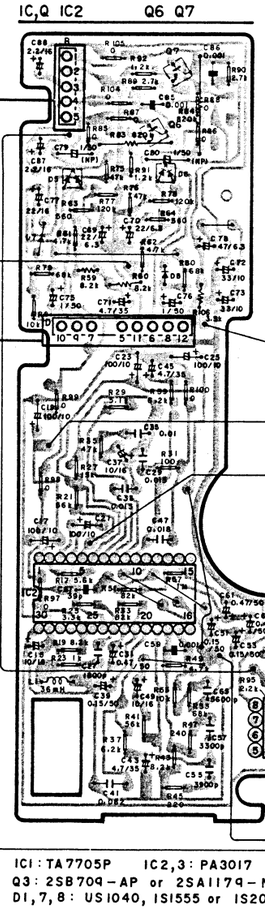
IC4

1	2	3	4	5	6	7	8
0.6V	0.6V		0V	0V			9.5V

HEAD P.C. BOARD



AUDIO UNIT(CWK-320)



IC1

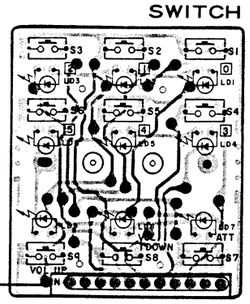
1	2	3	4	5	6	7	8	9	10
8.7V	3.2V	0V		3.2V	3.2V		0V	3.2V	
11	12	13	14	15	16				
				0V	3.2V				

IC2, IC3

1	2	3	4	5	6	7	8	9	10
9.4V		5.1V	0V	4.8V	5.1V	5.1V	5.1V	5.1V	5.1V
11	12	13	14	15	16	17	18	19	20
0V	1.3V	1V			5.4V	4.8V	5.1V	5.1V	5.1V
21	22	23	24	25	26	27	28	29	30
1.3V	1.3V	5.1V						0V	

SWITCH UNIT(A)

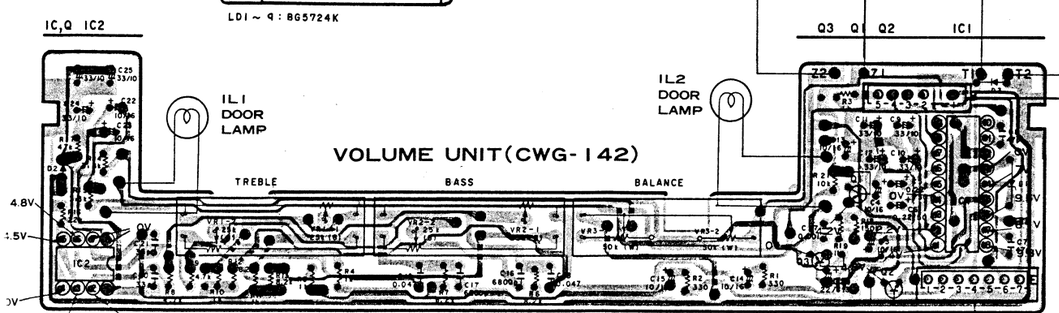
4	5	6
3V	1.6V	3V
10	11	12
		3V
16		



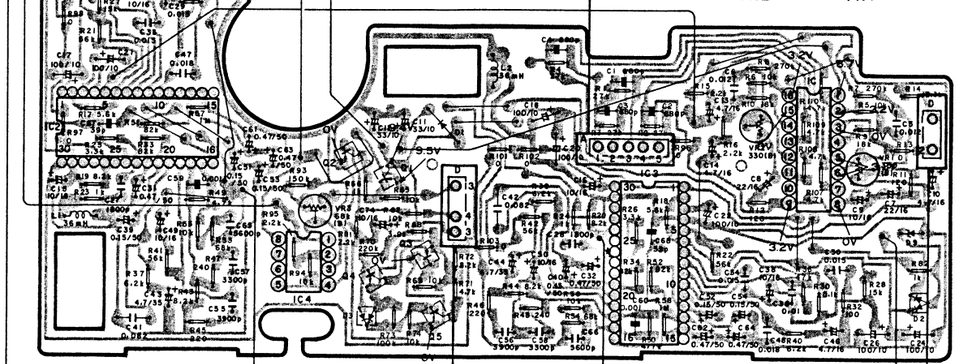
LD1 ~ 9 : BG5724K

S 26
DOOR
SWITCH

DOOR
SOLENOID
SO3



IC1 : PA0002A IC2 : TA7555BP Q1 : 2SA937F Q2, 3 : 2SC2021F D1 : RD6R8JB3 D2 : US1040, IS1555 or IS2076
D3 : IS1886, S1B01-01 or S1B01-02



IC1 : TA7705P IC2, 3 : PA3017 IC4 : HA17358 Q1 : 2SB779-R Q2, 4~7 : 2SD601-YR or 2SC2712-LG
Q3 : 2SB709-AP or 2SA1179-M5
D1, 7, 8 : US1040, IS1555 or IS2076 D2 : MA151WA D3, 5, 6 : MA151WK D9 : RD4R3EB3

Fig.55

17. QUICK RELEASE EXPLODED VIEW (FX-K9B/EW)

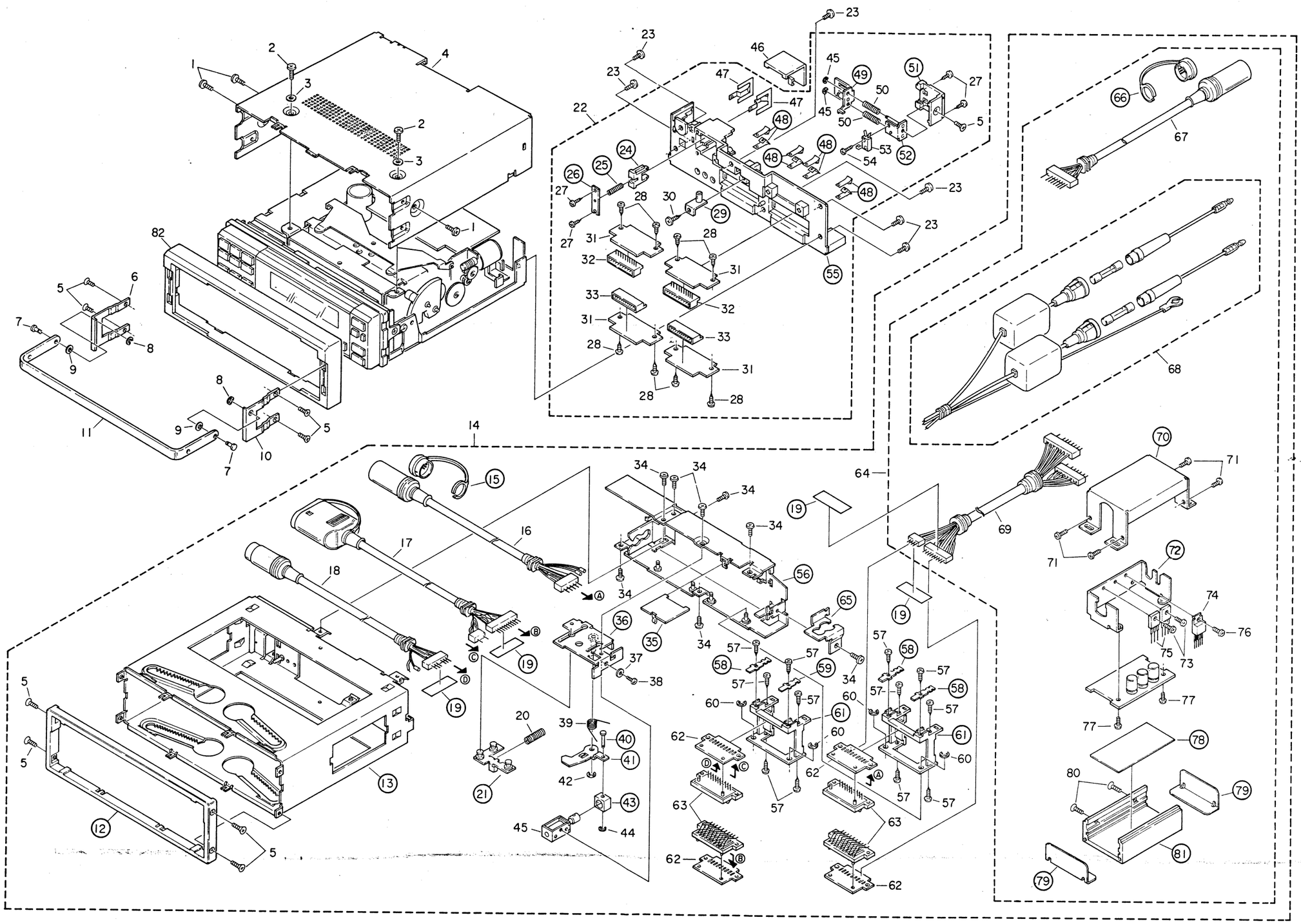


Fig. 56

Quick Release

- *For your parts Stock Control, the fast moving items are indicated with the marks ★ ★ and ★.*
  ★ ★: GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- *Parts whose parts numbers are omitted are subject to being not supplied.*

- **Parts List**

Mark	No.	Part No.	Description
	1.	CBA-151	Screw
	2.	BMZ23P050FCR	Screw
	3.	WB30FCR	Washer
	4.	CXD-278	Case Unit
	5.	CMZ26P040FZK	Screw
	6.	CNG-472	Holder
	7.	CLB-553	Pin
	8.	YE20FUC	Washer
	9.		Spring
	10.	CNG-476	Holder
	11.	CNG-471	Handle
	12.		Panel
	13.		Box
	14.	CXD-284	Quick Release Mounting Bracket Assy
	15.		Cap
	16.	CDF-832	Connector
	17.	CDF-831	Connector
	18.	CDF-833	Connector
	19.		Cover
	20.	CBH-789	Spring
	21.		Slide Plate
	22.	CXD-285	Rear Panel Assy
	23.	BMZ30P050FZK	Screw
	24.		Stopper
	25.		Spring
	26.		Holder
	27.	HBA-355	Screw
	28.	BTZ20P060FZK	Screw
	29.		Stopper
	30.	BTZ26P060FMC	Screw
	31.	CNL-529	P.C. Board
	32.	CKS-476	Connector
	33.	CKS-547	Connector
	34.	BMZ26P030FMC	Screw
	35.		Plunger Unit
	36.		Frame
	37.	WB20FZN	Washer
	38.	BMZ20P025FMC	Screw
	39.	CBH-783	Spring
	40.		Shaft
	41.		Lever
	42.	YE30FUC	Washer
	43.		Holder
	44.	YE15FUC	Washer
★	45.	CXP-042	Solenoid
	46.	CNW-714	Cover
	47.	CKF-072	Terminal
	48.		Terminal
	49.		Slide Plate
	50.	CBH-781	Spring
	51.		Cover
	52.		Holder
★ ★	53.	CSN-078	Switch
	54.	HBA-171	Screw
	55.		Holder
	56.		Cover
	57.	BTZ20P060FMC	Screw
	58.		Terminal
	59.		Terminal
	60.	YE25FUC	Washer
	61.		Holder
	62.	CNL-530	P.C. Board
	63.	CKS-528	Connector
	64.	CWX-555	Filter Assy
	65.		Holder
	66.		Cap
	67.	CDF-402	Connector
	68.	CDF-376	Cord
	69.	CDF-834	Connector
	70.		Case
	71.	BMZ26P050FMC	Screw
	72.		Holder
	73.	BMZ30P060FMC	Screw
★★	74.	PA3009	IC
★★	75.	2SA900	Transistor
	76.	BMZ30P050FMC	Screw
	77.	CBA-124	Screw
	78.		Insulator
	79.		Cover
	80.	CMZ30P080FMC	Screw
	81.		Heat Sink
	82.	CNK-138	Spacer

Fig. 56

18. CHASSIS (1) EXPLODED VIEW (FX-K9B/EW)

Chassis (1)

- **Parts List**

Mark	No.	Part No.	Description
	1 – 3.	VACANT	
	4.		Holder
	5.	CPV-031	Buzzer
	6.	HBA-181	Screw
	7.	CBA-151	Screw
	8.	CXD-278	Case Unit
	9.		Grille Volume Unit
	10.		Holder
	11.	CDF-371	Connector
	12.		Insulator
	13.	CKS-278	Plug
	14.	CKS-273	Plug
	15.	CKS-274	Plug
	16.		Holder
	17.	BMZ26P040FMC	Screw
	18.		Insulator
	19.	BMZ26P050FMC	Screw
	20.	BMZ26P070FCR	Screw
	21.		Chassis
	22.	CWX-530	Control Unit
	23.	BMZ20P050FMC	Screw
	24.	CWK-320	Audio Unit
	25.	CKS-314	Plug
	26.	CKS-183	Connector
	27.	CDF-372	Connector
	28.		Bracket
	29.	BMZ20P030FMC	Screw
	30.		Cover
	31.	CDF-287	Connector (8P)
	32.	CDF-286	Connector (9P)
	33.	CXK-041	Cassette Mechanism Assy
	34.		Heat Sink
	35.		Insulator
	36 – 51.	VACANT	
	52.	BMZ23P050FCR	Screw
	53.	WB30FCR	Washer
	54.	BMZ26P050FCR	Screw
	55.	CDF-835	Connector
	56.	CDF-905	Connector
	57.	CDF-836	Connector
	58.		Insulator

19. CHASSIS (1) EXPLODED VIEW (FX-K9SDK/WG, FX-K9/EW)

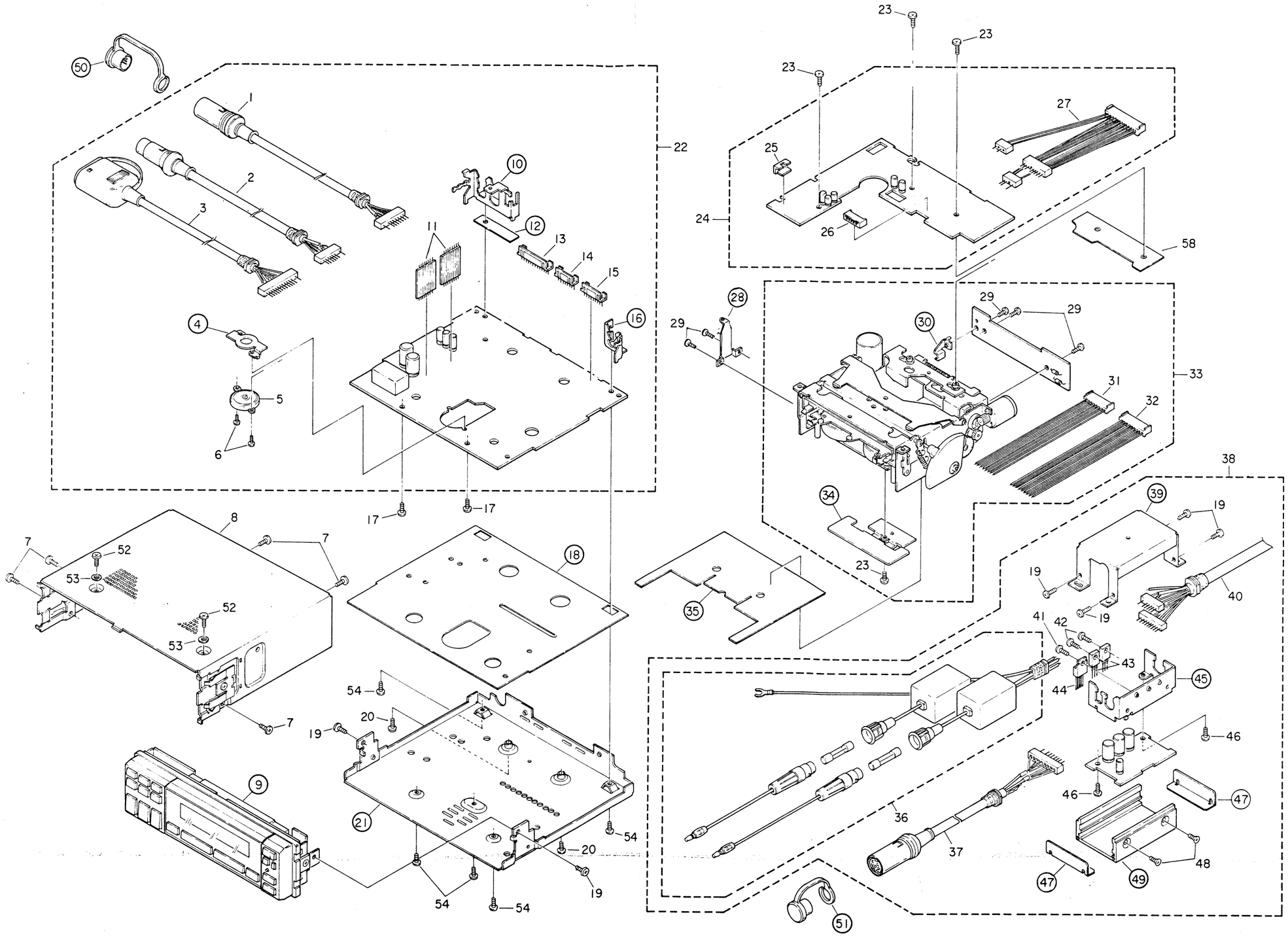


Fig. 58

- Chassis (1) (FX-K9B/EW)

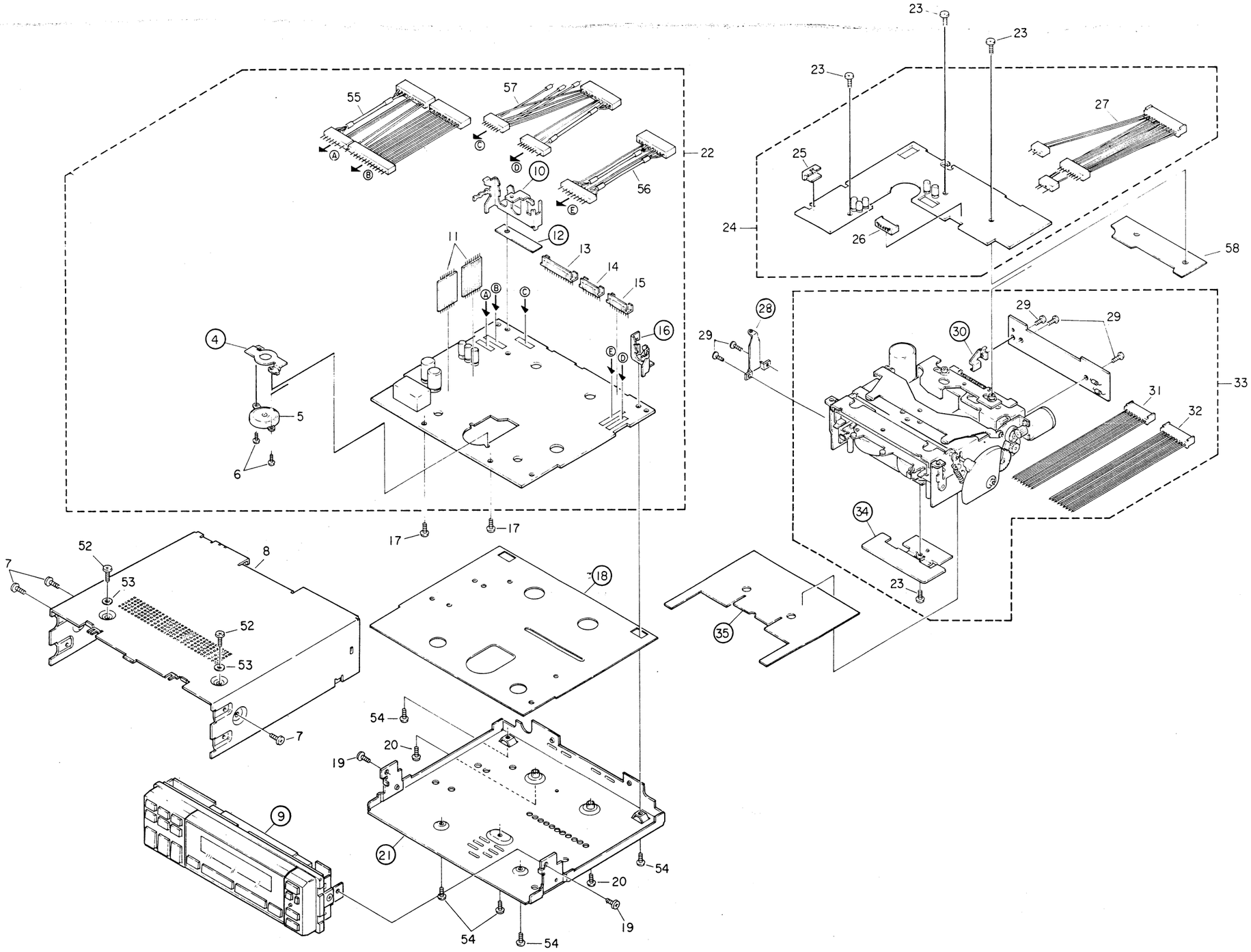


Fig. 57

Chassis (1) (FX-K9SDK/WG, FX-K9/EW)

- **Parts List**

Mark	No.	Part No.	Description	Mark	No.	Part No.	Description
	1.	CDF-560	Connector		30.		Cover
	2.	CDF-554	Connector		31.	CDF-287	Connector (8P)
	3.	CDF-558	Connector		32.	CDF-286	Connector (9P)
	4.		Holder		33.	CXK-041	Cassette Mechanism Assy
	5.	CPV-031	Buzzer		34.		Heat Sink
	6.	HBA-181	Screw		35.		Insulator
	7.	CBA-151	Screw		36.	CDF-376	Cord
	8.	CXD-280	Case Unit		37.	CDF-402	Connector
	9.		Grille Volume Unit		38.	CWX-450	Filter Assy
	10.		Holder		39.		Case
	11.	CDF-371	Connector		40.	CDF-561	Cord
	12.		Insulator		41.	BMZ30P050FMC	Screw
	13.	CKS-278	Plug		42.	BMZ30P060FMC	Screw
	14.	CKS-273	Plug	★★	43.	2SA900	Transistor
	15.	CKS-274	Plug	★★	44.	PA3009	IC
	16.		Holder		45.		Holder
	17.	BMZ26P040FMC	Screw		46.	CBA-124	Screw
	18.		Insulator		47.		Cover
	19.	BMZ26P050FMC	Screw		48.	CMZ30P080FMC	Screw
	20.	BMZ26P070FMC	Screw		49.		Heat Sink
	21.		Chassis		50.		Cap
	22.	CWX-529	Control Unit (FX-K9SDK/WG)		51.		Cap
		CWX-528	Control Unit (FX-K9/EW)		52.	BMZ23P050FCR	Screw
	23.	BMZ20P050FMC	Screw		53.	WB30FCR	Washer
	24.	CWK-320	Audio Unit		54.	BMZ26P050FMC	Screw
	25.	CKS-314	Plug	55 –	57.	VACANT	
	26.	CKS-183	Connector		58.		Insulator
	27.	CDF-372	Connector				
	28.		Bracket				
	29.	BMZ20P030FMC	Screw				

20. CHASSIS (2) EXPLODED VIEW

Chassis (2)

- **Parts List**

Mark	No.	Part No.	Description	Mark	No.	Part No.	Description
	1.	CBH-750	Spring	★	10.	BG5724K	LED
	2.	CNS-942	Grille	★★	11.	CSG-212	Switch
	3.	CNK-143	Plate		12.	CNW-568	Holder
	4.	CMZ30P050FMC	Screw		13.	CWW-162	LED Array
	5.	CNS-941	Grille		14.	CNW-924	Cushion
	6.	YE20FUC	Washer		15.	CNM-923	Cushion
	7.	CNW-575	Plate	★	16.	CAC-607	Button (Green)
	8.	CNM-920	Cushion	★	17.	CAC-605	Button
	9.	CP5208GLR	Display (FX-K9B/EW, FX-K9/EW)	★	18.	CAC-606	Button
		CP5157DGLR	Display (FX-K9SDK/WG)				

Mark	No.	Part No.	Description
	19.	CWS-209	Display Unit (FX-K9B/EW, FX-K9/EW)
		CWS-210	Display Unit (FX-K9SDK/WG)
	20.	VACANT	
	21.	CNW-570	Spacer
	22.	CNM-914	Cushion
★	23.	CAC-772	Button (0) (FX-K9B/EW, FX-K9/EW)
		CAC-798	Button (SDK) (FX-K9SDK/WG)
★	24.	CAC-773	Button (1)
★	25.	CAC-774	Button (2)
★	26.	CAC-775	Button (3)
★	27.	CAC-776	Button (4)
★	28.	CAC-611	Button (Attenuator)
★	29.	CAC-580	Button (–)
★	30.	CAC-777	Button (5)
★	31.	CAC-579	Button (+)
	32.	CNM-929	Cushion
	33.	CNW-569	Lens
	34.	CBA-126	Screw
	35.	CXC-928	Bearing Unit
	36.	CNM-930	Cover
	37.	CNF-849	Holder
	38.		P.C. Board
	39.	CBH-751	Spring
	40.	CAT-176	Door
	41.		Pin
	42.		Holder
★	43.	CXP-041	Solenoid (Door)
	44.		P.C. Board
	45.	BTZ20P080FMC	Screw
	46.	CNM-925	Insulator
★★	47.	CSG-211	Switch
★★	48.	CSG-212	Switch
	49.	CNL-356	P.C. Board
	50.		P.C. Board
	51.	CNW-571	Spacer
	52.	CNM-913	Cushion
★	53.	CAC-577	Button (Open/Eject)
★	54.	CAC-588	Button (Clock)
★	55.	CAC-610	Button (Program Timer)
★	56.	CAC-615	Button (Cancel)
★	57.	CAC-608	Button (Tape)
★	58.	CAC-609	Button (Tuner)
	59.	CXD-288	Grille Unit (FX-K9B/EW, FX-K9/EW)
		CXD-290	Grille Unit (FX-K9SDK/WG)
	60.	CNL-355	P.C. Board
	61.	PLZ20P080FNi	Screw
	62.	CAH-227	Plate (FX-K9B/EW, FX-K9/EW)
		CAH-228	Plate (FX-K9SDK/WG)
	63.	VACANT	
★★	64.	CWS-173	Switch Assy
	65.	YE15FUC	Washer
	66.	CNF-844	Lever
	67.	BMZ20P050FMC	Screw
	68.	HBA-171	Screw
	69.	CBH-749	Spring
	70.		Holder
	71.	CNW-574	Guide
★★	72.	CSN-078	Switch (Door)
	73.	BMZ20P025FMC	Screw
	74.	BTZ20P080FMC	Screw
	75.		Guide
	76.	CNM-927	Spacer
★★	77.	CEL-129	Lamp, 14V 40mA
	78.	CNW-573	Holder
	79.	BMZ20P030FMC	Screw
★	80.	CXD-090	Knob Unit
	81.	BMZ26P050FMC	Screw
	82.		Insulator
	83.		Spacer
	84.	BMZ30P060FMC	Screw
★★	85.	2SA900	Transistor
	86.		Heat Sink
★★	87.	2SC1568	Transistor
	88.	BMZ30P040FMC	Screw
★★	89.	BA6209	IC
	90.	CWX-499	Power Unit (FX-K9SDK/WG, FX-K9/EW)
		CWX-531	Power Unit (FX-K9B/EW)
	91.	CDF-373	Connector
	92.	CKS-179	Plug
★★	93.	CCS-331	Volume (Balance)
	94.	CNN-305	Insulator
★★	95.	CCS-332	Volume (Bass, Treble)
	96.		Frame Unit
	97.	CWG-142	Volume Unit
	98.	HBF-120	Washer

- Chassis (2)

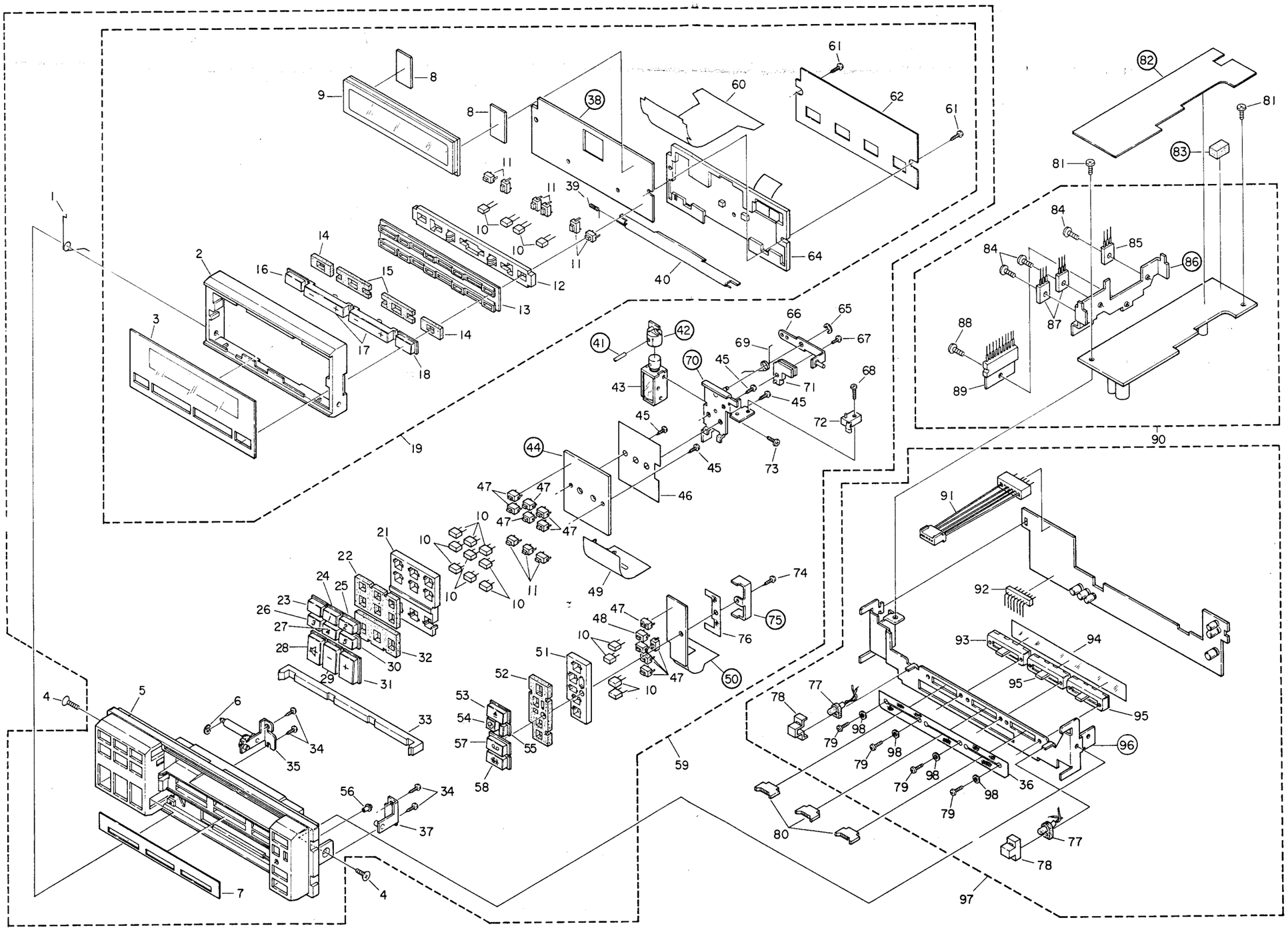


Fig. 59

21. CASSETTE MECHANISM EXPLODED VIEW

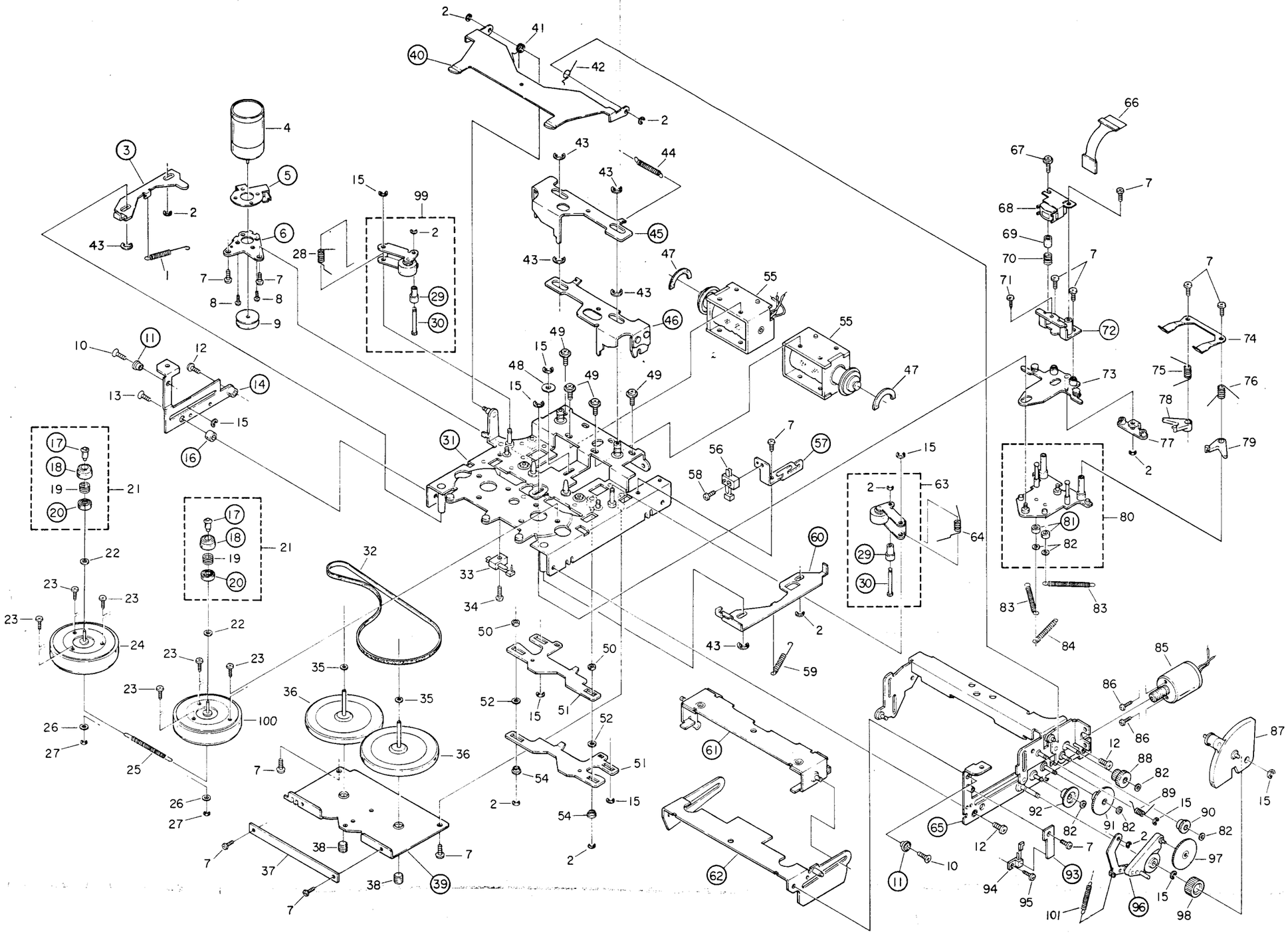


Fig. 60

Cassette Mechanism

• Parts List

Mark	No.	Part No.	Description
	1.	CBH-593	Spring
	2.	YE15FUC	Washer
	3.		Slide Plate
★★	4.	CXM-069	Motor (Capstan)
	5.		Cover
	6.		Bracket
	7.	BMZ20P030FMC	Screw
	8.	CBA-098	Screw
	9.	CLB-430	Pulley
	10.	CMZ20P040FMC	Screw
	11.		Bush
	12.	BMZ26P050FMC	Screw
	13.	CMZ26P030FMC	Screw
	14.		Bracket Unit
	15.	YE20FUC	
	16.		Bush
	17.		Reel
	18.		Collar
	19.	CBH-653	Spring
	20.		Bush
★★	21.	CXC-829	Reel Unit
	22.	CBF-136	Washer
	23.	CBA-132	Screw
★★	24.	CXM-403	Reel Motor
	25.	CBH-654	Spring
	26.	WA17D032D050	Washer
	27.	YE12FUC	Washer
	28.	CBH-598	Spring
	29.		Roller
	30.		Shaft
	31.		Chassis Unit
★★	32.	CNT-099	Belt
★★	33.	CSN-068	Switch (CST SET)
	34.	BMZ20P080FMC	Screw
	35.	WA21D040D025	Washer
	36.	CNR-165	Flywheel
	37.	CNL-291	P.C. Board
	38.	CNV-984	Screw
	39.		Plate
	40.		Arm
	41.	CBH-716	Spring
	42.	CBH-748	Spring
	43.	YE30FUC	Washer
	44.	CBH-594	Spring
	45.		Slide Plate Unit
	46.		Slide Plate Unit
	47.	CNM-672	Spacer
	48.	WC26FMC	Washer
	49.	PMS26P030FUC	Screw
	50.	CLB-039	Roller
	51.	CNE-888	Cam
	52.	WA26D047D025	Washer
	53.	VACANT	
	54.	CLB-038	Roller
★	55.	CXP-038	Solenoid
★★	56.	CSN-075	Switch (CrO_2)
	57.		Bracket
	58.	BMZ20P060FMC	Screw
	59.	CBH-728	Spring
	60.		Slide Plate
	61.		Holder Unit
	62.		Arm Unit
★★	63.	CXC-285	Pinch Holder Unit
	64.	CBH-597	Spring
	65.		Side Frame Unit
	66.	CNL-195	P.C. Board
	67.	PMS20G060FMC	Screw
★★	68.	CPB-352	Head
	69.	CNV-301	Rubber
	70.	CBH-198	Spring
	71.	BMZ20P040FMC	Screw
	72.	CXC-625	Head Base Unit
	73.	CXC-194	Slide Plate Unit
	74.	CNE-921	Spring
	75.	CBH-600	Spring
	76.	CBH-599	Spring
	77.	CXC-196	Cam Unit
	78.	CNW-174	Arm
	79.	CNW-175	Arm
	80.	CXC-195	Slide Plate Unit
	81.		Roller
	82.	CBF-045	Washer
	83.	CBH-596	Spring
	84.	CBH-595	Spring
★★	85.	CXC-814	Motor Unit (Loading)
	86.	CBA-108	Screw
	87.	CXC-961	Gear Unit
	88.	CNW-578	Gear
	89.	CBH-759	Spring
	90.	CNW-579	Gear
	91.	CNW-448	Gear
	92.	CNW-449	Gear
	93.		P.C. Board
★★	94.	HSN-135	Switch (CST IN)
	95.	BMZ17P030FMC	Screw
	96.		Arm Unit
	97.	CNW-452	Gear
	98.	CNW-453	Gear
★★	99.	CXC-198	Pinch Holder Unit
★★	100.	CXM-404	Reel Motor
	101.	CBH-777	Spring

22. ELECTRICAL PARTS LIST

NOTE:

When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).

560Ω	*56 X 10^1*	*561*	*RD1/4PS 5 6 1 J*
47kΩ	*47 X 10^3*	*473*	*RD1/4PS 4 7 3 J*
0.5Ω	*0R5*		*RN2H 0 R 5 K*
1Ω	*010*		*RS1P 0 1 0 K*

Ex. 2 When there are 3 effeictive digits (such as in high precision metal film resistors).

5.62kΩ	*562 X 10^1*		*RN1/4SR 5 6 2 1 F*

- *For your parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★: GENERALLY MOVES FASTER THAN ★.
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- *Parts whose parts numbers are omitted are subject to being not supplied.*

Audio Unit (CWK-320)

MISCELLANEOUS

Mark	Symbol & Description		Part No.
★★	IC1		TA7705P
★★	IC2, IC3		PA3017
★★	IC4		HA17358
★★	Q1	Chip Transistor	2SB779-R or 2SB779-S
★★	Q2, Q4 – Q7	Chip Transistor	2SC2712-LG or 2SC2712-LL or 2SD601-YR or 2SD601-YS
★★	Q3	Chip Transistor	2SB709-AP or 2SB709-AQ or 2SB709-AR or 2SA1179-M5 or 2SA1179-M6 or 2SA1179-M7
★	D1, D7, D8		US1040 or 1S1555 or 1S2076
★	D2	Chip Diode	MA151WA
★	D3, D5, D6	Chip Diode	MA151WK
★	D9		RD4R3EB3
	L1, L2	Coil	CTH-077
★★	VR1, VR2	Semi-fixed, 330Ω (B)	CCP-171
★★	VR3	Semi-fixed, 68kΩ (B)	CCP-185

RESISTORS

Mark	Symbol & Description	Part No.
	R1 – R58, R61 – R82, R85 – R105, R107 – R111 Chip Resistor	RS1/8S □□□J
	R59, R60, R83, R84, R106	RD1/6PS □□□J

CAPACITORS

Mark	Symbol & Description		Part No.
	C1 – C4	Chip Capacitor	CKSYB681K50
	C5, C6		CQMA123J50L
	C7, C8, C77		CEA220M16LS
	C9, C15, C16, C37, C38, C49, C50, C74		CEA100M16LS
	C10, C13, C14, C43 – C46, C71		CEA4R7M16LS
	C11, C12, C72, C73		CEA330M10LS
	C17 – C26		CEA101M10L2
	C27, C28		CQMA182J50L
	C29, C30, C33, C34		CQMA153J50L
	C31, C32, C61 – C64		CEAR47M50LS
	C35, C36		CQMA103J50L
	C39, C40, C51 – C54		CEAR15M50LS
	C41, C42		CQMA823J50L
	C47, C48		CQMA183J50L
	C55, C56		CQMA392J50L
	C57, C58		CQMA332J50L
	C59, C60, C85, C86	Chip Capacitor	CKSYB102K50
	C65, C66		CQMA562J50L
	C67, C68	Chip Capacitor	CCSCH390J50
	C69, C70		CEA220M6R3LS
	C75, C76		CEA010M50LS
	C78		CEA470M6R3LS
	C79, C80		CEA010M50NP
	C87, C88		CEA2R2M35LS

Filter Assy (CWX-555) (FX-K9B/EW)
Filter Assy (CWX-450) (FX-K9/EW, FX-K9SDK/WG)

Mark	Symbol & Description	Part No.
★★	IC1	PA3009
★★	Q1, Q2	2SA900
	R1	RN1/2PR22J
	R2, R3	RD1/4PM562J
	C1, C2	CEA010M50L2
	C3 – C5	CEA471M16L2
	C6, C7	CQMA473K50L

Display Unit (CWS-209) (FX-K9B/EW, FX-K9/EW)
Display Unit (CWS-210) (FX-K9SDK/WG)

Mark	Symbol & Description		Part No.
★★	IC1		PD7005
★★	Q1, Q2	Chip Transistor	2SC2712-LG or 2SC2712-LL or 2SC2712-LY or 2SD601-YQ or 2SD601-YR or 2SD601-YS
★	D1	Chip Diode	MA151WA
★	D2	Chip Diode	MA151A
★	LD10 – LD13	LED	BG5724K
★★	S10 – S15	Switch	CSG-212
★★	S16	Switch Assy	CWS-173
★	LED Array		CWW-162
	Display (FX-K9B/EW, FX-K9/EW)		CP5208GLR
	Display (FX-K9SDK/WG)		CP5157DGLR
	R1 – R18	Chip Resistor	RS1/8S □□□J
	C1	Chip Capacitor	CCSCH101J50

Plunger Unit (FX-K9B/EW)

Mark	Symbol & Description	Part No.
★★	Q1	2SC2458
★★	D1, D2	1S2473 or 1S1555
	R1	RD1/6PS □□□J
	C1	CEA470M16LS

Power Unit (CWX-499) (FX-K9SDK/WG, FX-K9/EW)

MISCELLANEOUS

Mark	Symbol & Description		Part No.
★★	IC1		PA0002A
★★	IC2		BA6209
★★	Q1		2SA900
★★	Q2		2SC2021F
★★	Q3		2SC3113
★★	Q4		2SC2634NC
★★	Q5, Q6		2SC1568
★	D1, D4, D6, D7		1S2473VH
★	D2		RD8R2EB2
★	D3		HZ7B2 or RD7R5EB1
★	D5		RD4R7JB3
★	D8		S5566 or 1S1886
★	D9		HZ11B1
★★	VR1	Semi-fixed, 68kΩ (B)	CCP-212

RESISTORS

Mark	Symbol & Description		Part No.
	R1 – R14, R16 – R23	Chip Resistor	RS1/8S □□□J
	R15		RN1P4R7JL

CAPACITORS

Mark	Symbol & Description		Part No.
	C1, C9	Chip Capacitor	CKSYB102K50
	C2		CEA2R2M50L2
	C3, C4		CKDBC563K25
	C5	8200pF	CCE-020
	C6		CEA2R2M50L2
	C7		CEA010M50L2
	C8		CKDBC473K25
	C10		CKDBC223K25
	C11		CEA3R3M50L2
	C12, C13	Chip Capacitor	CKSYB103K50
	C14		CEA100M16L2
	C15, C20		CEA101M10L2
	C16, C17, C21		CEA221M10L2
	C18		CEA471M16L2
	C19		CEA101M6R3L2
	C22		CEA470M10L2

Power Unit (CWX-531) (FX-K9B/EW)

MISCELLANEOUS

Mark	Symbol & Description		Part No.
★★	IC1		PA0002A
★★	IC2		BA6209
★★	Q1		2SA900
★★	Q2		2SC2021F
★★	Q3		2SC3113
★★	Q4		2SC2634NC
★★	Q5, Q6		2SC1568
★	D1, D4, D6, D7		1S2473VH
★	D2		RD8R2EB2
★	D3		HZ7B2 or RD7R5EB1
★	D5		RD5R6JB2
★	D8		S5566 or 1S1886
★	D9		HZ11B1
★★	VR1	Semi-fixed, 68kΩ (B)	CCP-212

RESISTORS

Mark	Symbol & Description		Part No.
	R1 – R14, R16 – R23	Chip Resistor	RS1/8S □□□J
	R15		RN1P4R7JL

CAPACITORS

Mark	Symbol & Description		Part No.
	C1, C9	Chip Capacitor	CKSYB102K50
	C2		CEA2R2M50L2
	C3, C4		CKDBC563K25
	C5	8200pF	CCE-020
	C6		CEA2R2M50LL
	C7		CEA010M50LS2
	C8		CKDBC473K25
	C10		CKDBC223K25
	C11		CEA3R3M50L2
	C12, C13	Chip Capacitor	CKSYB103K50
	C14		CEA100M16L2
	C15, C20		CEA101M10L2
	C16, C21		CEA221M10L2
	C17		CEA4R7M25L2
	C18		CEA471M16L2
	C19		CEA101M6R3L2
	C22		CEA470M10L2

Head P.C. Board

Mark	Symbol & Description		Part No.
★★	HD1	Head	CPB-352

Reel P.C. Board

Mark	Symbol & Description	Part No.
	C1, C2	CKPYD102M50

P.C. Board

Mark	Symbol & Description	Part No.
★★	Q1	2SA1048
★	D1, D2	DS135
	C3 – C5	CKPYX103M25

Volume Unit (CWG-142)

MISCELLANEOUS

Mark	Symbol & Description		Part No.
★★	IC1		PA0005A
★★	IC2		TA75558P
★★	Q1		2SA937F
★★	Q2, Q3		2SC2021F
★	D1		RD6R8JB3
★	D2		US1040 or 1S1555 or 1S2076
★	D3		1S1886 or SIB01-01 or SIB01-02
★★	VR1, VR2	Volume, 25kΩ (B) (TREBLE, BASS)	CCS-332
★★	VR3	Volume, 50kΩ (W) (BALANCE)	CCS-331
★★	IL1, IL2	Lamp, 14V 40 mA	CEL-129

RESISTORS

Mark	Symbol & Description	Part No.
	R1 – R19, R21	RD1/6VS □□□J

CAPACITORS

Mark	Symbol & Description	Part No.
	C3, C4, C13 – C15, C22, C23	CEA100M16LS
	C5, C6	CEAR22M50LS
	C7, C8	CCDSL470J50L
	C9 – C12, C24 – C26	CEA330M10LS
	C16, C17	CQMA682J50L
	C18, C19	CQMA473J50L
	C20, C21	CCDSL330J50L
	C27	CKDYB102K50L
	C28	CEA220M6R3LS

Switch Unit (A)

Mark	Symbol & Description	Part No.
★	LD1 – LD9 LED	BG5724K
★★	S1 – S6 Switch	CSG-211
★★	S7 – S9 Switch (ATT, DOWN, UP)	CSG-212

Switch Unit (B)

Mark	Symbol & Description	Part No.
★	LD26 – LD29 LED	BG5724K
★★	S20, S21, S23 – S25 Switch	CSG-211
★★	S22 Switch (CLOCK)	CSG-212

Miscellaneous Parts List

Mark	Symbol & Description	Part No
★★	S1 Switch (METAL)	CSN-075
★★	S2 Switch (CST IN)	HSN-135
★★	S3 Switch (CST SET)	CSN-068
★★	S26 Switch (Door)	CSN-078
★★	S27 Switch (FX-K9B/EW)	CSN-078
★★	M1 Motor Unit (Loading)	CXC-814
★★	M2 Motor (Capstan)	CXM-069
★★	M3 Motor (Reverse Reel)	CXM-404
★★	M4 Motor (Forward Reel)	CXM-403
★★	SO1, SO2 Solenoid	CXP-038
★	SO3 Solenoid (Door)	CXP-041
★	SO4 Solenoid (FX-K9B/EW)	CXP-042

23. PACKING METHOD (FX-K9B/EW)

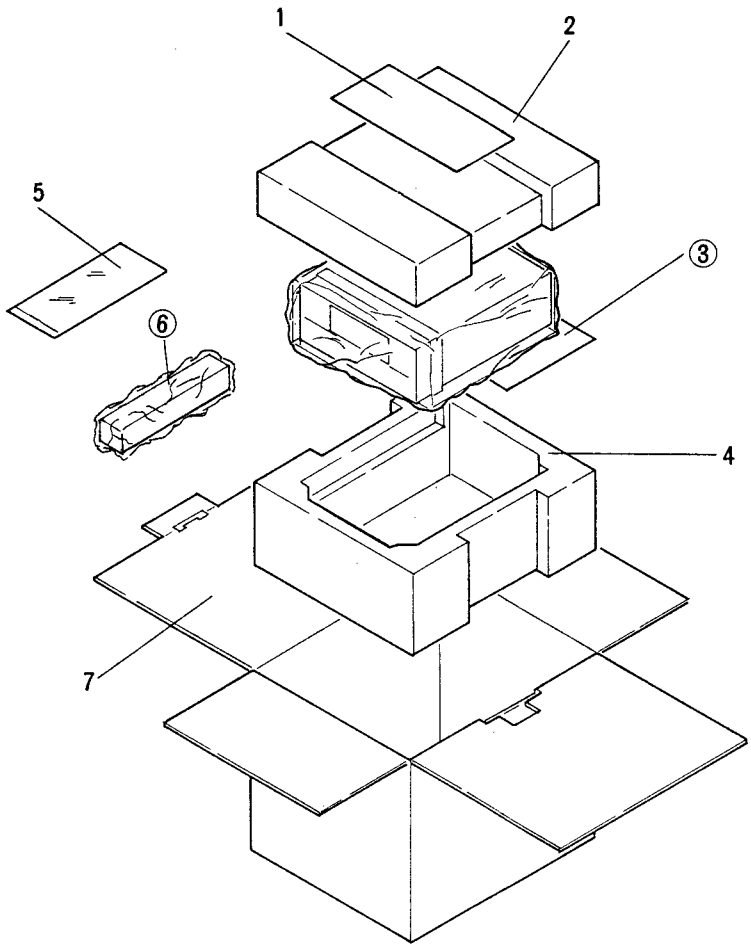


Fig. 61

• Parts List

Mark	No.	Part No.	Description	Mark	No.	Part No.	Description
	1.	CRD-466	Owner's Manual (English, French, Italian, Spanish) Card		5-3-1.	CNW-772	Gear
					5-3-2.	CNW-827	Spanner
					5-4.		Screw Assy
					5-4-1.	CBA-028	Screw
	2.	CHD-573	Styrofoam		5-4-2.	CBA-102	Screw
	3.		Board		5-4-3.	NF40FMC	Nut
	4.	CHD-572	Styrofoam		5-4-4.	NF50FMC	Nut
	5.	CEA-986	Accessory Kit		5-4-5.	WS40FMC	Washer
	5-1.	CDE-437	Cord		6.		Cover
	5-2.	CNF-111	Strap		7.	CHD-574	Carton
	5-3.		Gear Assy				

24. PACKING METHOD (FX-K9SDK/WG, FX-K9/EW)

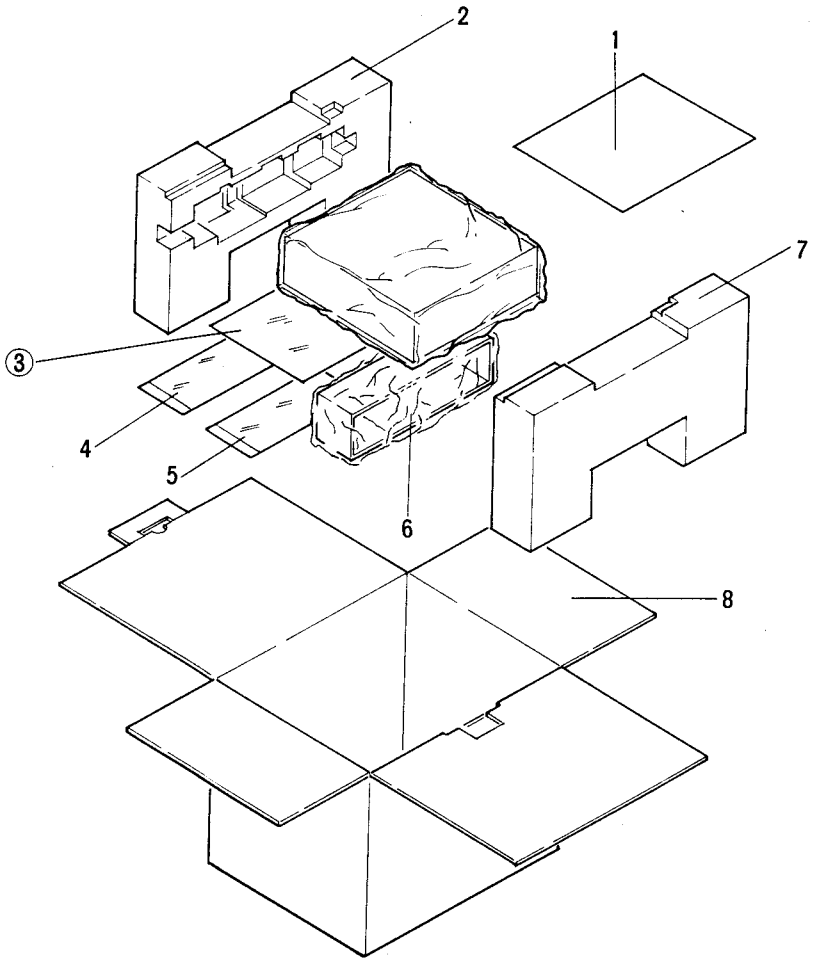


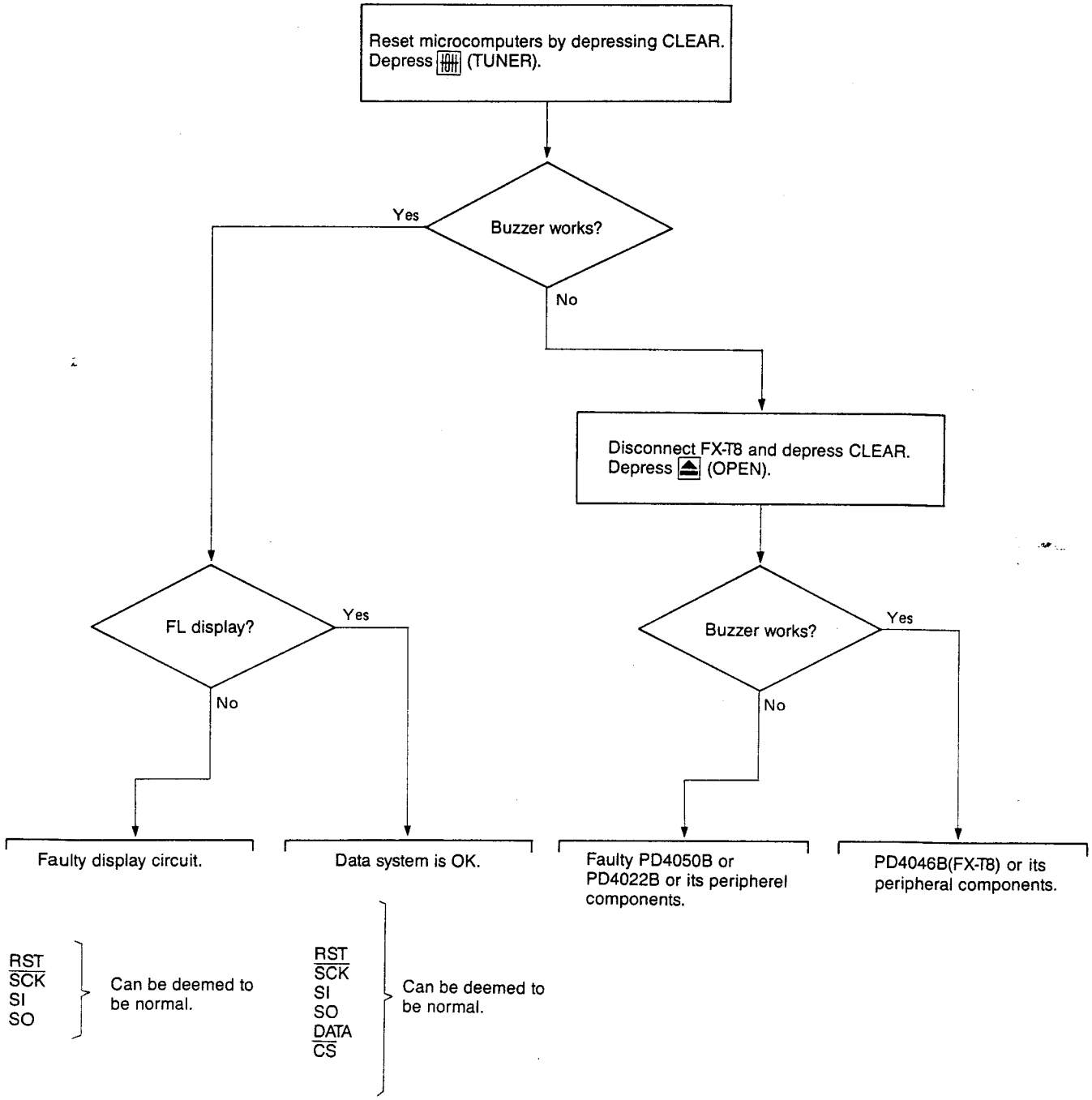
Fig. 62

● Parts List

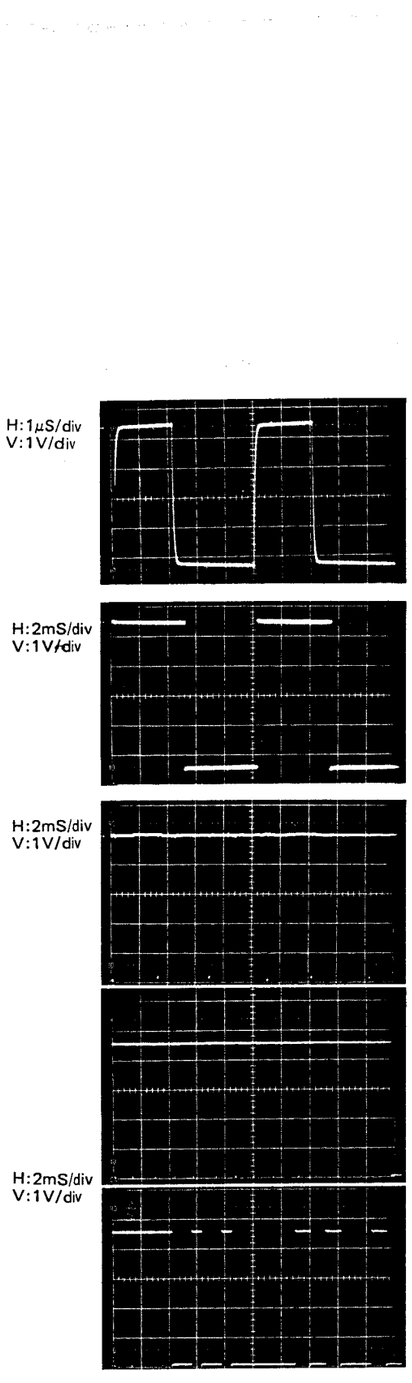
Mark	No.	Part No.	Description	Mark	No.	Part No.	Description
	1.	CRD-465	Owner's Manual (FX-K9SDK/WG)		4-4.	CNW-642	Holder
			(English, French, German)		4-5.		Screw Assy
		CRD-463	Owner's Manual (FX-K9/EW)		4-5-1.	CBA-028	Screw
			(English, French, German,		4-5-2.	NF40FMC	Nut
			Spanish)		4-5-3.	NF50FMC	Nut
		CRD-464	Owner's Manual (FX-K9/EW)		4-5-4.	PMB50Y160FMC	Screw
			(Swedish, Norwegian, Dutch,		4-5-5.	WS40FMC	Washer
			Italian)		5.	CNW-757	Holder
			Card			CNB-793	Panel
	2.	CHD-571	Styrofoam		6.	CNG-223	Holder
	3.		Board		7.	CHD-570	Styrofoam
	4.	CEA-885	Accessory Kit		8.	CHD-568	Carton (FX-K9SDK/WG)
	4-1.	CDE-437	Cord			CHD-566	Carton (FX-K9/EW)
	4-2.	CNF-111	Strap				
	4-3.	CNF-382	Lever				

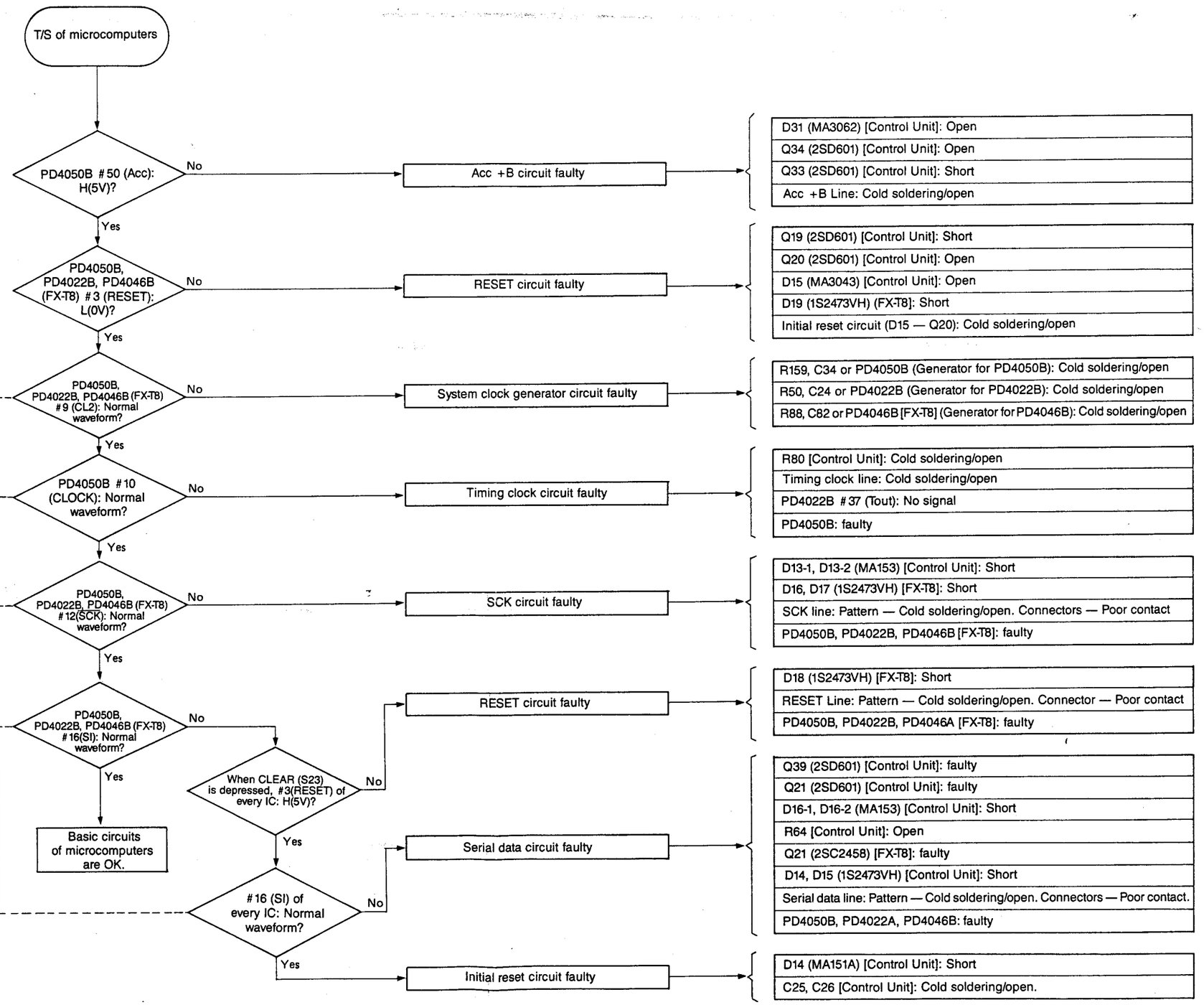
25. TROUBLESHOOTING

First see if the data communication system is faulty.

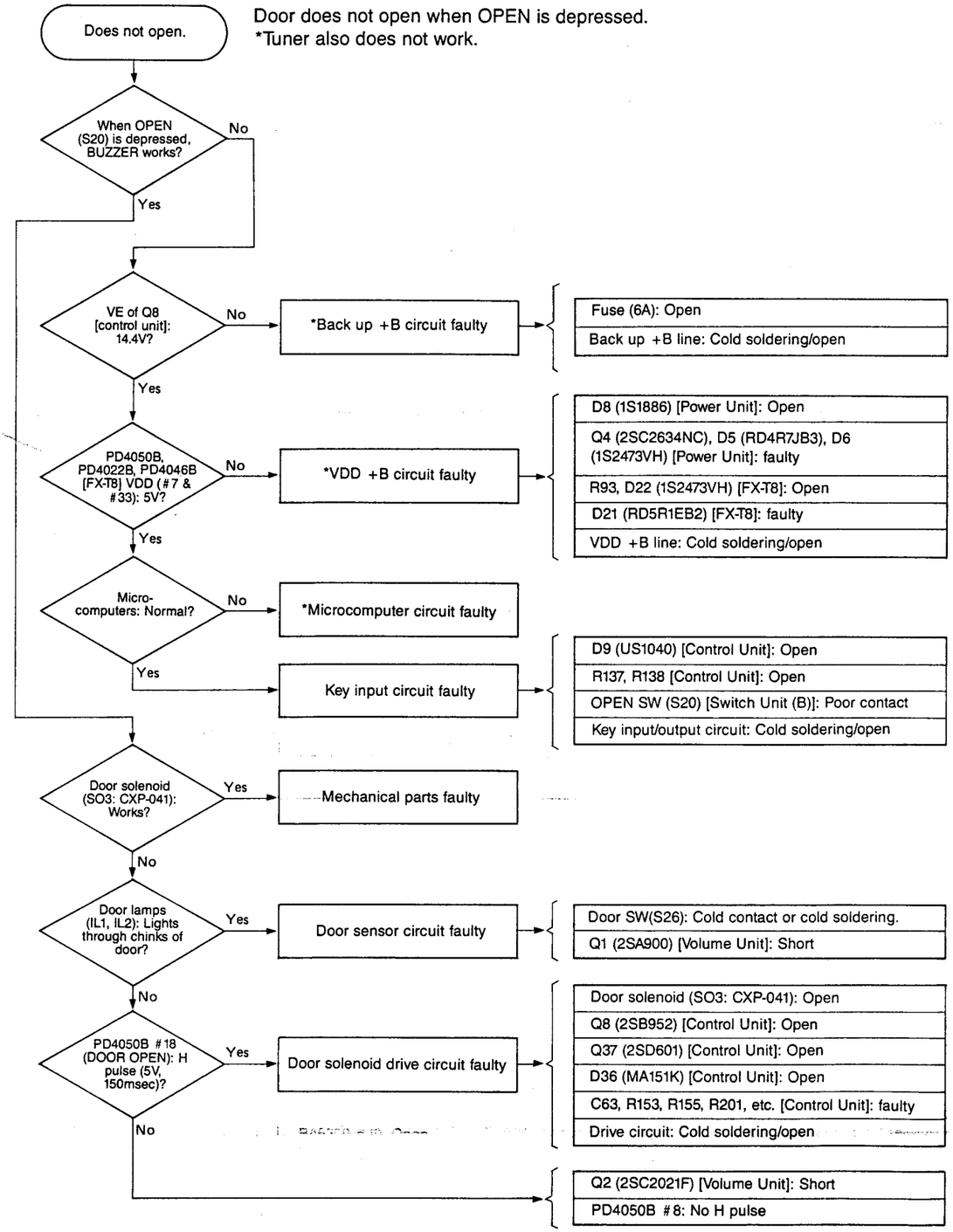


25.1 TROUBLESHOOTING MICROCOMPUTERS.



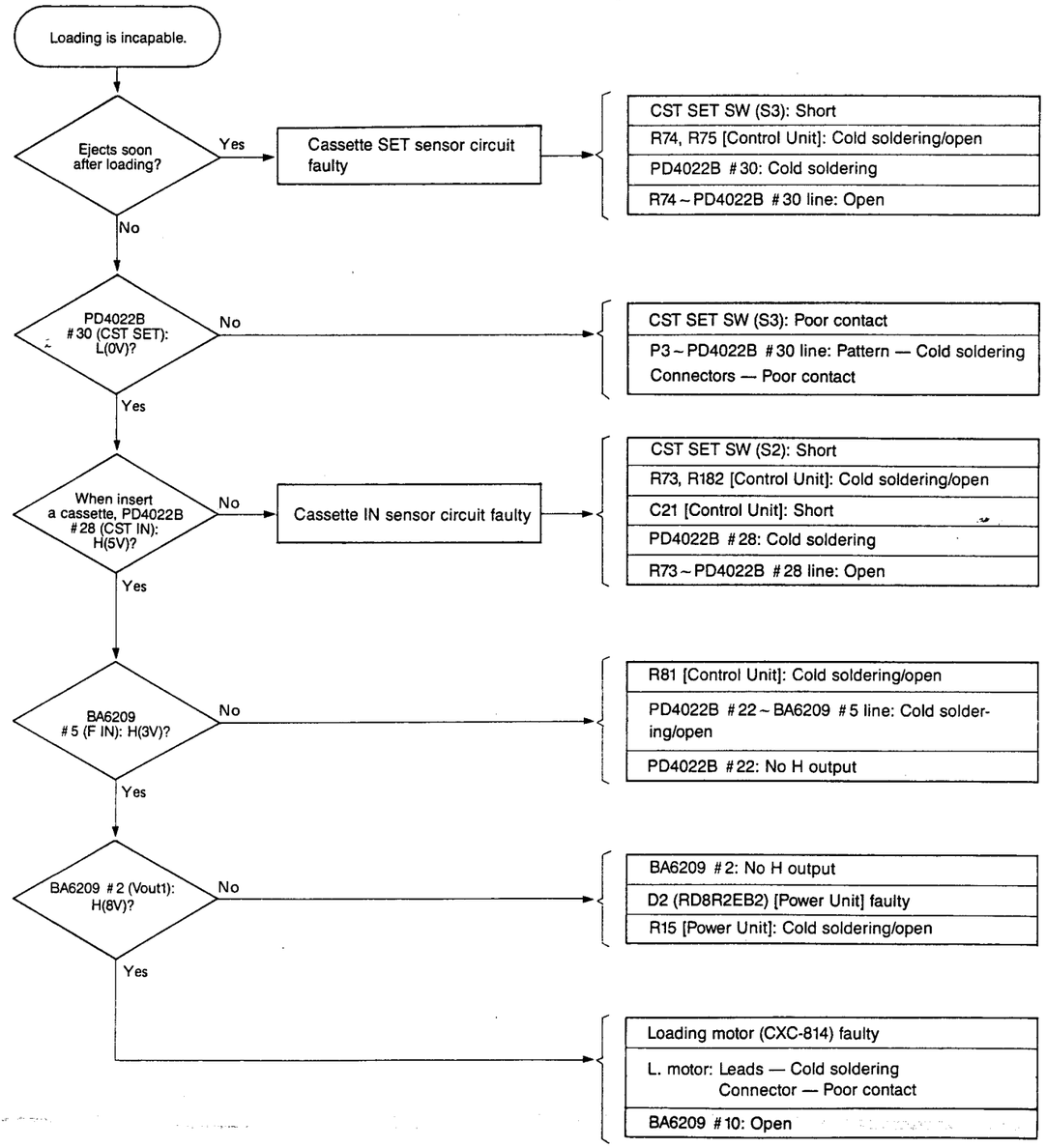

T/S of microcomputers
PD4050B #50 (Acc): H(5V)?
No
Acc +B circuit faulty
D31 (MA3062) [Control Unit]: Open
Q34 (2SD601) [Control Unit]: Open
Q33 (2SD601) [Control Unit]: Short
Acc +B Line: Cold soldering/open
Yes
PD4050B, PD4022B, PD4046B (FX-T8) #3 (RESET): L(0V)?
No
RESET circuit faulty
Q19 (2SD601) [Control Unit]: Short
Q20 (2SD601) [Control Unit]: Open
D15 (MA3043) [Control Unit]: Open
D19 (1S2473VH) (FX-T8]: Short
Initial reset circuit (D15 — Q20): Cold soldering/open
Yes
PD4050B, PD4022B, PD4046B (FX-T8) #9 (CL2): Normal waveform?
No
System clock generator circuit faulty
R159, C34 or PD4050B (Generator for PD4050B): Cold soldering/open
R50, C24 or PD4022B (Generator for PD4022B): Cold soldering/open
R88, C82 or PD4046B [FX-T8] (Generator for PD4046B): Cold soldering/open
Yes
PD4050B #10 (CLOCK): Normal waveform?
No
Timing clock circuit faulty
R80 [Control Unit]: Cold soldering/open
Timing clock line: Cold soldering/open
PD4022B #37 (Tout): No signal
PD4050B: faulty
Yes
PD4050B, PD4022B, PD4046B (FX-T8) #12(SCK): Normal waveform?
No
SCK circuit faulty
D13-1, D13-2 (MA153) [Control Unit]: Short
D16, D17 (1S2473VH) [FX-T8]: Short
SCK line: Pattern — Cold soldering/open. Connectors — Poor contact
PD4050B, PD4022B, PD4046B [FX-T8]: faulty
Yes
PD4050B, PD4022B, PD4046B (FX-T8) #16(SI): Normal waveform?
No
RESET circuit faulty
D18 (1S2473VH) [FX-T8]: Short
RESET Line: Pattern — Cold soldering/open. Connector — Poor contact
PD4050B, PD4022B, PD4046A [FX-T8]: faulty
Yes
When CLEAR (S23) is depressed, #3(RESET) of every IC: H(5V)?
No
Yes
Basic circuits of microcomputers are OK.
Serial data circuit faulty
Q39 (2SD601) [Control Unit]: faulty
Q21 (2SD601) [Control Unit]: faulty
D16-1, D16-2 (MA153) [Control Unit]: Short
R64 [Control Unit]: Open
Q21 (2SC2458) [FX-T8]: faulty
D14, D15 (1S2473VH) [Control Unit]: Short
Serial data line: Pattern — Cold soldering/open. Connectors — Poor contact.
PD4050B, PD4022A, PD4046B: faulty
#16 (SI) of every IC: Normal waveform?
No
Yes
Initial reset circuit faulty
D14 (MA151A) [Control Unit]: Short
C25, C26 [Control Unit]: Cold soldering/open.

25.2 DOOR DOES NOT OPEN.


Does not open.
Door does not open when OPEN is depressed.
*Tuner also does not work.
When OPEN (S20) is depressed, BUZZER works?
No
Yes
VE of Q8 [control unit]: 14.4V?
No
*Back up +B circuit faulty
Fuse (6A): Open
Back up +B line: Cold soldering/open
Yes
PD4050B, PD4022B, PD4046B [FX-T8] VDD (#7 & #33): 5V?
No
*VDD +B circuit faulty
D8 (1S1886) [Power Unit]: Open
Q4 (2SC2634NC), D5 (RD4R7JB3), D6 (1S2473VH) [Power Unit]: faulty
R93, D22 (1S2473VH) [FX-T8]: Open
D21 (RD5R1EB2) [FX-T8]: faulty
VDD +B line: Cold soldering/open
Yes
Micro-computers: Normal?
No
*Microcomputer circuit faulty
Yes
Key input circuit faulty
D9 (US1040) [Control Unit]: Open
R137, R138 [Control Unit]: Open
OPEN SW (S20) [Switch Unit (B)]: Poor contact
Key input/output circuit: Cold soldering/open
Door solenoid (SO3: CXP-041): Works?
Yes
Mechanical parts faulty
No
Door lamps (IL1, IL2): Lights through chinks of door?
Yes
Door sensor circuit faulty
Door SW(S26): Cold contact or cold soldering.
Q1 (2SA900) [Volume Unit]: Short
No
PD4050B #18 (DOOR OPEN): H pulse (5V, 150msec)?
Yes
Door solenoid drive circuit faulty
Door solenoid (SO3: CXP-041): Open
Q8 (2SB952) [Control Unit]: Open
Q37 (2SD601) [Control Unit]: Open
D36 (MA151K) [Control Unit]: Open
C63, R153, R155, R201, etc. [Control Unit]: faulty
Drive circuit: Cold soldering/open
No
Q2 (2SC2021F) [Volume Unit]: Short
PD4050B #8: No H pulse

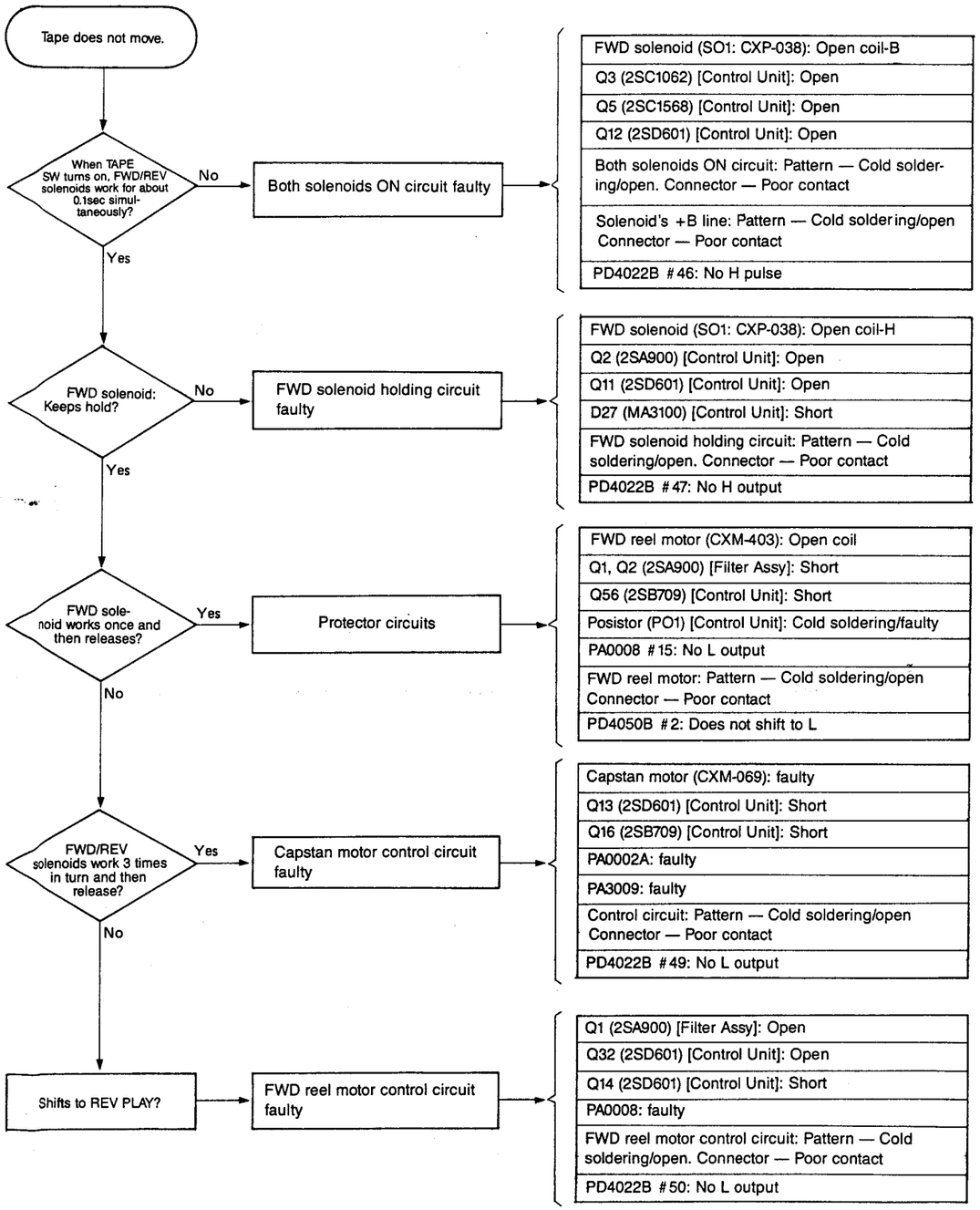
25.3 LOADING (SET) IS INCAPABLE.

Loading incapable after inserting a cassette, or it ejects soon after loading.


Loading is incapable.
Ejects soon after loading?
Yes
Cassette SET sensor circuit faulty
CST SET SW (S3): Short
R74, R75 [Control Unit]: Cold soldering/open
PD4022B #30: Cold soldering
R74 ~ PD4022B #30 line: Open
No
PD4022B #30 (CST SET): L(0V)?
No
CST SET SW (S3): Poor contact
P3 ~ PD4022B #30 line: Pattern — Cold soldering
Connectors — Poor contact
Yes
When insert a cassette, PD4022B #28 (CST IN): H(5V)?
No
Cassette IN sensor circuit faulty
CST SET SW (S2): Short
R73, R182 [Control Unit]: Cold soldering/open
C21 [Control Unit]: Short
PD4022B #28: Cold soldering
R73 ~ PD4022B #28 line: Open
Yes
BA6209 #5 (F IN): H(3V)?
No
R81 [Control Unit]: Cold soldering/open
PD4022B #22 ~ BA6209 #5 line: Cold soldering/open
PD4022B #22: No H output
Yes
BA6209 #2 (Vout1): H(8V)?
No
BA6209 #2: No H output
D2 (RD8R2EB2) [Power Unit] faulty
R15 [Power Unit]: Cold soldering/open
Yes
Loading motor (CXC-814) faulty
L. motor: Leads — Cold soldering
Connector — Poor contact
BA6209 #10: Open

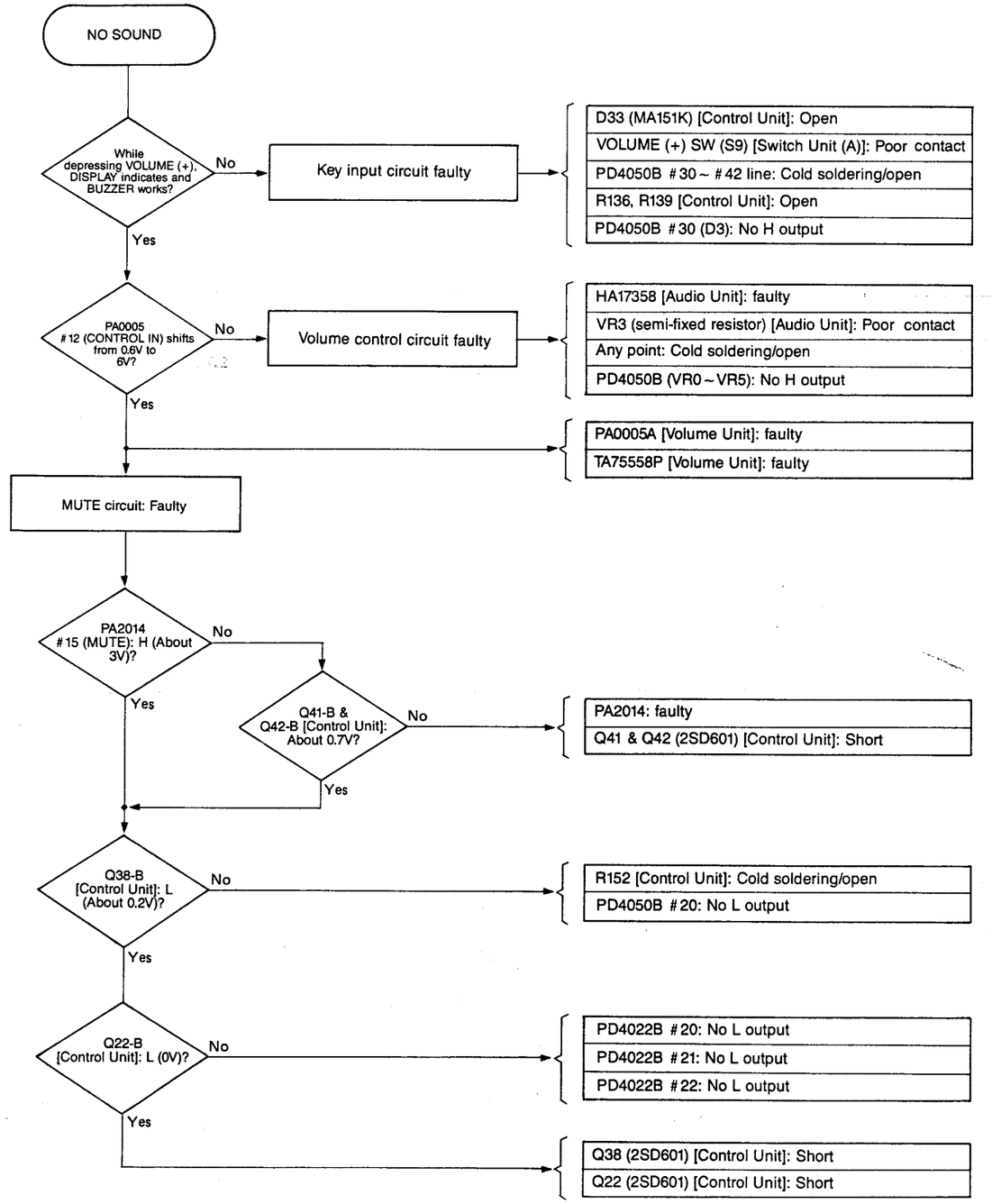
25.4 DECK IS DEAD.

Tape does not move (FWD PLAY) after loading.


Tape does not move.
When TAPE SW turns on, FWD/REV solenoids work for about 0.1sec simultaneously?
No
Both solenoids ON circuit faulty
FWD solenoid (SO1: CXP-038): Open coil-B
Q3 (2SC1062) [Control Unit]: Open
Q5 (2SC1568) [Control Unit]: Open
Q12 (2SD601) [Control Unit]: Open
Both solenoids ON circuit: Pattern — Cold soldering/open. Connector — Poor contact
Solenoid's +B line: Pattern — Cold soldering/open Connector — Poor contact
PD4022B #46: No H pulse
Yes
FWD solenoid: Keeps hold?
No
FWD solenoid holding circuit faulty
FWD solenoid (SO1: CXP-038): Open coil-H
Q2 (2SA900) [Control Unit]: Open
Q11 (2SD601) [Control Unit]: Open
D27 (MA3100) [Control Unit]: Short
FWD solenoid holding circuit: Pattern — Cold soldering/open. Connector — Poor contact
PD4022B #47: No H output
Yes
FWD solenoid works once and then releases?
Yes
Protector circuits
FWD reel motor (CXM-403): Open coil
Q1, Q2 (2SA900) [Filter Assy]: Short
Q56 (2SB709) [Control Unit]: Short
Posistor (PO1) [Control Unit]: Cold soldering/faulty
PA0008 #15: No L output
FWD reel motor: Pattern — Cold soldering/open Connector — Poor contact
PD4050B #2: Does not shift to L
No
FWD/REV solenoids work 3 times in turn and then release?
Yes
Capstan motor control circuit faulty
Capstan motor (CXM-069): faulty
Q13 (2SD601) [Control Unit]: Short
Q16 (2SB709) [Control Unit]: Short
PA0002A: faulty
PA3009: faulty
Control circuit: Pattern — Cold soldering/open Connector — Poor contact
PD4022B #49: No L output
No
Shifts to REV PLAY?
FWD reel motor control circuit faulty
Q1 (2SA900) [Filter Assy]: Open
Q32 (2SD601) [Control Unit]: Open
Q14 (2SD601) [Control Unit]: Short
PA0008: faulty
FWD reel motor control circuit: Pattern — Cold soldering/open. Connector — Poor contact
PD4022B #50: No L output

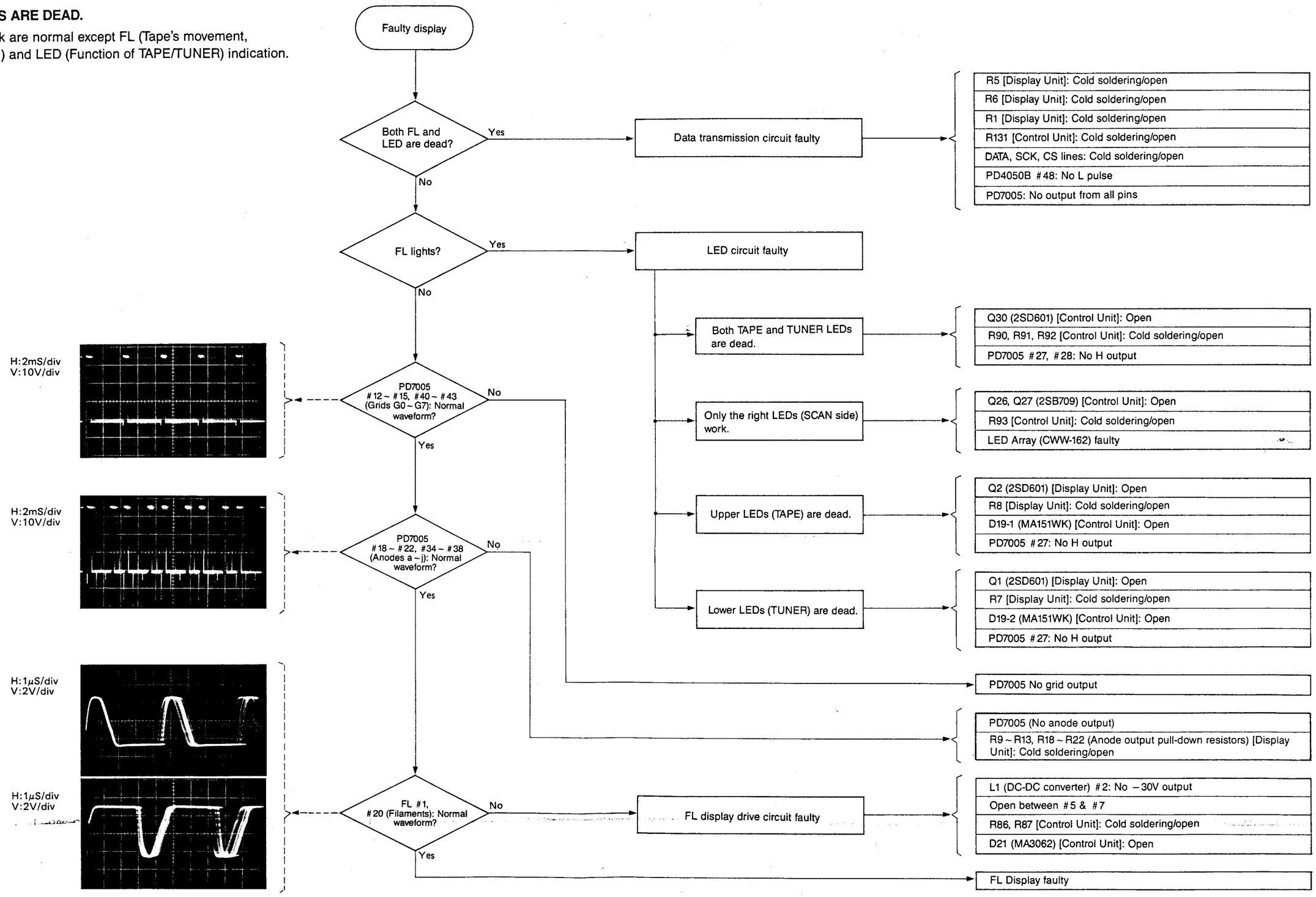
25.5 NO SOUND

Deck and Tuner are OK (displays normally), but no sound on R & L channels.


NO SOUND
While depressing VOLUME (+), DISPLAY indicates and BUZZER works?
No
Key input circuit faulty
D33 (MA151K) [Control Unit]: Open
VOLUME (+) SW (S9) [Switch Unit (A)]: Poor contact
PD4050B #30 ~ #42 line: Cold soldering/open
R136, R139 [Control Unit]: Open
PD4050B #30 (D3): No H output
Yes
PA0005 #12 (CONTROL IN) shifts from 0.6V to 6V?
No
Volume control circuit faulty
HA17358 [Audio Unit]: faulty
VR3 (semi-fixed resistor) [Audio Unit]: Poor contact
Any point: Cold soldering/open
PD4050B (VR0 ~ VR5): No H output
Yes
PA0005A [Volume Unit]: faulty
TA75558P [Volume Unit]: faulty
MUTE circuit: Faulty
PA2014 #15 (MUTE): H (About 3V)?
No
Q41-B & Q42-B [Control Unit]: About 0.7V?
No
PA2014: faulty
Q41 & Q42 (2SD601) [Control Unit]: Short
Yes
Yes
Q38-B [Control Unit]: L (About 0.2V)?
No
R152 [Control Unit]: Cold soldering/open
PD4050B #20: No L output
Yes
Q22-B [Control Unit]: L (0V)?
No
PD4022B #20: No L output
PD4022B #21: No L output
PD4022B #22: No L output
Yes
Q38 (2SD601) [Control Unit]: Short
Q22 (2SD601) [Control Unit]: Short

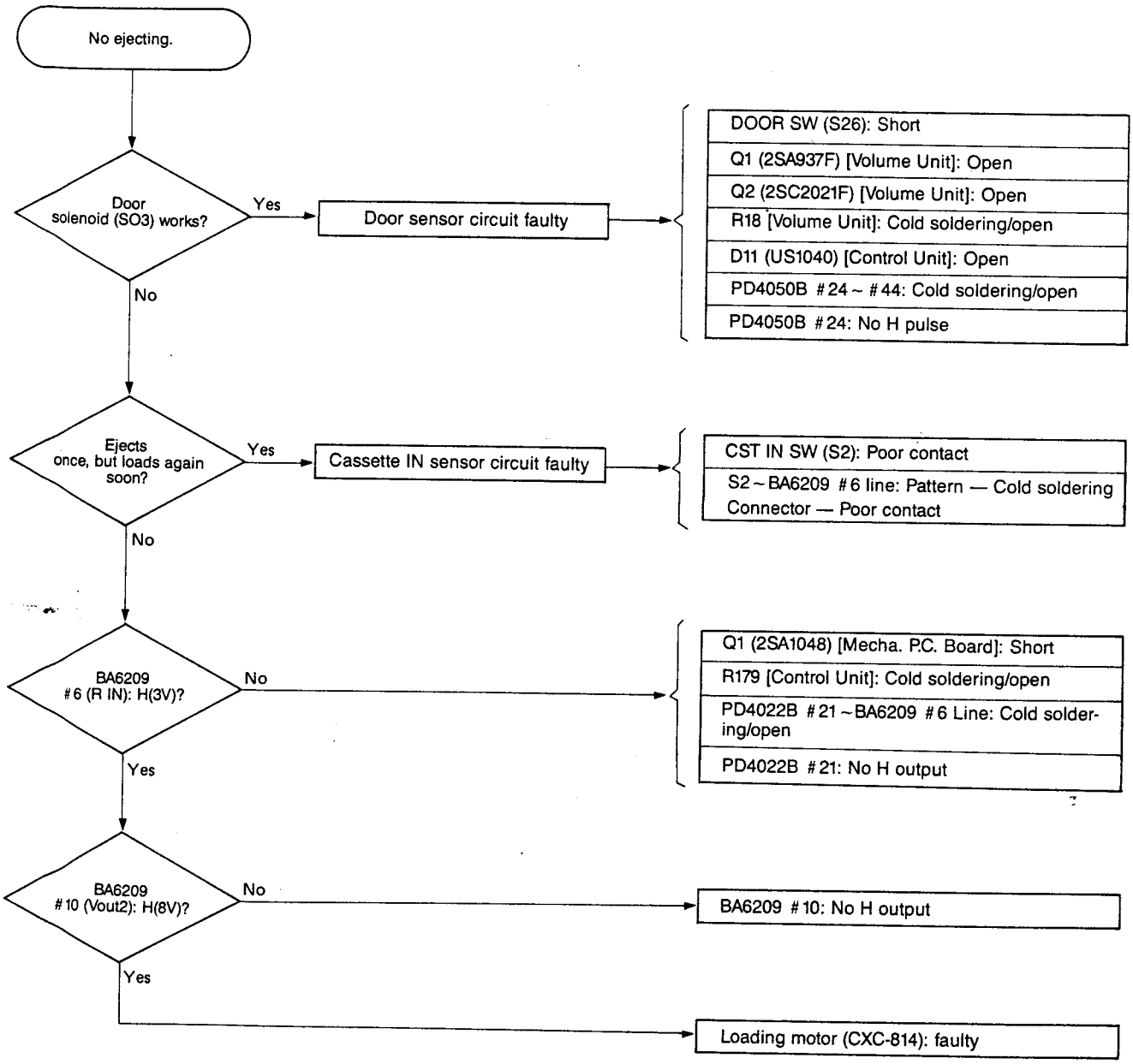
25.6 DISPLAYS ARE DEAD.

Tuner and Deck are normal except FL (Tape's movement, Frequency, etc.) and LED (Function of TAPE/TUNER) indication.


Faulty display
Both FL and LED are dead?
Yes
No
Data transmission circuit faulty
R5 [Display Unit]: Cold soldering/open
R6 [Display Unit]: Cold soldering/open
R1 [Display Unit]: Cold soldering/open
R131 [Control Unit]: Cold soldering/open
DATA, SCK, CS lines: Cold soldering/open
PD4050B #48: No L pulse
PD7005: No output from all pins
FL lights?
Yes
No
LED circuit faulty
Both TAPE and TUNER LEDs are dead.
Q30 (2SD601) [Control Unit]: Open
R90, R91, R92 [Control Unit]: Cold soldering/open
PD7005 #27, #28: No H output
Only the right LEDs (SCAN side) work.
Q26, Q27 (2SB709) [Control Unit]: Open
R93 [Control Unit]: Cold soldering/open
LED Array (CWW-162) faulty
Upper LEDs (TAPE) are dead.
Q2 (2SD601) [Display Unit]: Open
R8 [Display Unit]: Cold soldering/open
D19-1 (MA151WK) [Control Unit]: Open
PD7005 #27: No H output
Lower LEDs (TUNER) are dead.
Q1 (2SD601) [Display Unit]: Open
R7 [Display Unit]: Cold soldering/open
D19-2 (MA151WK) [Control Unit]: Open
PD7005 #27: No H output
H:2mS/div
V:10V/div
PD7005 #12 ~ #15, #40 ~ #43 (Grids G0 ~ G7): Normal waveform?
No
Yes
H:2mS/div
V:10V/div
PD7005 #18 ~ #22, #34 ~ #38 (Anodes a ~ j): Normal waveform?
No
Yes
PD7005 No grid output
H:1μS/div
V:2V/div
PD7005 (No anode output)
R9 ~ R13, R18 ~ R22 (Anode output pull-down resistors) [Display Unit]: Cold soldering/open
H:1μS/div
V:2V/div
FL #1, #20 (Filaments): Normal waveform?
No
Yes
FL display drive circuit faulty
L1 (DC-DC converter) #2: No −30V output
Open between #5 & #7
R86, R87 [Control Unit]: Cold soldering/open
D21 (MA3062) [Control Unit]: Open
FL Display faulty

25.7 EJECTING IS INCAPABLE.

Loading is possible, but not ejecting.


No ejecting.
Door solenoid (SO3) works?
Yes
Door sensor circuit faulty
DOOR SW (S26): Short
Q1 (2SA937F) [Volume Unit]: Open
Q2 (2SC2021F) [Volume Unit]: Open
R18 [Volume Unit]: Cold soldering/open
D11 (US1040) [Control Unit]: Open
PD4050B #24 ~ #44: Cold soldering/open
PD4050B #24: No H pulse
No
Ejects once, but loads again soon?
Yes
Cassette IN sensor circuit faulty
CST IN SW (S2): Poor contact
S2 ~ BA6209 #6 line: Pattern — Cold soldering
Connector — Poor contact
No
BA6209 #6 (R IN): H(3V)?
No
Q1 (2SA1048) [Mecha. P.C. Board]: Short
R179 [Control Unit]: Cold soldering/open
PD4022B #21 ~ BA6209 #6 Line: Cold soldering/open
PD4022B #21: No H output
Yes
BA6209 #10 (Vout2): H(8V)?
No
BA6209 #10: No H output
Yes
Loading motor (CXC-814): faulty